

# FMT

## Handwritten notes

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Name: \_\_\_\_\_

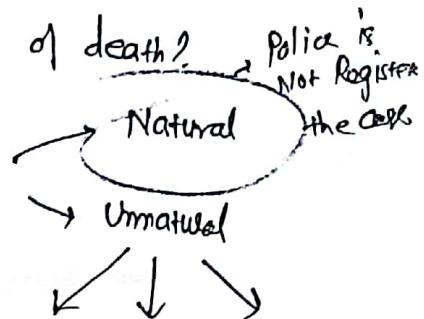
Subject: FMT



MBBSHELP.COM

Forensic Medicine → Application of Medicine in Law.

After P.M. ⇒ What is the Manner of death?  
 ↓  
 it means death is



Q. 33 yr old ♀; Healthy condn; visited her friend in hospital. Returned home & had hemiplegia & contusion all over body? cause of death?

- H/o → How Many Years (∴ Marriage)  
 - Any H/o Disease  
 - Any H/o Drug intake

⇒ OCP induced coagulopathy  
 ↓  
 Natural cause of death

↗ followed only by doctors  
 ↗ followed by anybody  
 (doctors, government, patients, etc.)

Medical Jurisprudence

- Law in Medicine

How the Law affects all profession

Medical etiquette

→ Conventional Law of Courtesy  
 e.g. Not charge for doctors colleague  
 → A breach of etiquette is Not punishable

Medical Ethics

→ Moral Principles  
 → Self imposed code of conduct.

MCI / SMC

Code of Medical EthicsWARNING NOTICES

6 A's ⇒ ①

②

③

④

⑤

⑥

⇒ Unqualified individuals  
 Like compounder

- Advertise on Small Board  
 - Name, Qualification  
 - can't display fee other than chamber  
 - Not more than twice advertisement.

ADULTERY (Cheating of spouses)

ASSOCIATION / COVERTING

ADVERTISEMENT

ALCOHOL (Not examine & drink cond)

ADDICTION (Being drug addict)

ABORTION (UNLAWFUL)

↳ violates the MTP

⑦ ISSUING FAKE CERTIFICATES: Any certificates

Death  
Birth  
Disability  
MLC

⑧ DICHOTOMY ('FEE SPLITTING')

- ⑨ PROFESSIONAL SECRECY

Concerned Authority

exception  $\Rightarrow$

PRIVILEGED COMMUNICATION

CIVIL Suits

C: Crime  
I: Infection  
V: General  
I: in Patient's  
C: Court of Law

S: Servants & Employees

I: Interest & sell

N: Notifiable & Negligence suits

Crime  $\rightarrow$  Some one told  
that he act the  
Crime

Concerned Authority

It makes communication Privileged.

$\rightarrow$  Tell the Police

- Some one has AIDS  $\rightarrow$  Sexual partner
- Court
- Patient Interest - e.g. Colour blindness - call tacker

9) Violates the warning notice

↓  
Serious Professional Misconduct / Inflammatory conduct / Ethical Negligence

Punishment

(A) WARNING

Again

Fine

Imprisonment

(B) PENAL ERASURE  
OR

PROFESSIONAL DEATH SENTENCE

Temporary

Permanent

$\rightarrow$  Given by court only.

$\Rightarrow$  Punishment of Inflammatory conduct is given by firstly  
"State Medical council"

(2)

Who decides in SMC?  $\Rightarrow$  Professional colleague in SMC

↓  
if Not happy w/ the decision; Appeal

↓  
Af Central Health Ministry  
↓ Forward to  
MCI

Q: The Disciplinary control over Professional Misconduct is primarily Maintained in  $\Rightarrow$  "State Medical council (SMC)"

### LEGAL PROCEDURE

INDIAN PENAL CODE (1860)  $\Rightarrow$  Definition & Punishment of crime  
(I.P.C.)

CRIMINAL PROCEDURE COURT (1973)  $\Rightarrow$  Procedure followed after crime

INDIAN EVIDENCE ACT (1872)  $\Rightarrow$

[RPC: only in J&K  
CrPC: Not valid under section 370  
Ranbir Panel code]

↓ Definition / Relevancy / Recording / Weightage of evidence  
↓

Oral > Written  
↓ blc of cross-examination

AMENDED/ MODIFIED  $\Rightarrow$  CRIMINAL LAW (AMENDMENT) ACT, 2013

### INQUEST

① POLICE INQUEST;

↓ Inquiry into the cause of death

② MAGISTRATE INQUEST;

③ CORONER INQUEST;  $\rightarrow$  started in 1872; Last done 1999 (Bombay)

④ MEDICAL EXAMINER INQUEST.  $\rightarrow$  Best inquest  $\rightarrow$  JURY decide the guilty / not guilty  
↓ Odd No. of Members (5, 7, 9, 11, 13)

POLICE INQUEST  $\Rightarrow$  174 Cr.P.C; M/c in Grindia NEE<sup>LL</sup>

↳ Lowest Ranking who do the Police inquest  $\Rightarrow$  Head constable

MAGISTRATE INQUEST  $\Rightarrow$  176 Cr.P.C

↳ done in  $\rightarrow$

constable



Head constable  $\rightarrow$  Lowest Police to  
↓ conduct inquest.

Assistant sub-inspector



Sub-inspector  $\rightarrow$  Inspector  $\rightarrow$  SHO  
(Station House Officer)

- ① Death in custody;
- ② Death in Prison;
- ③ Death in Police living;
- ④ Exhumation
- ⑤ Dowry death

↳ e.g. death in juvenile home, death in outside court

↳ Judicial Magistrate

↳ Executive Magistrate / Mahrishi / Sub-divisional Magistrate / District Magistrate / Collector

↳ Death in 7yr of Marriage

• DOWRY DEATH  $\Rightarrow$  304 (B) I.P.C

↳ Punishment  $\Rightarrow$  7 Yr - L.I. \*\*

• DEMANDING DOWRY  $\Rightarrow$  Dowry Prohibition Act; 1961

↳ 5 yrs + 15000/- + Return the dowry = Punishment

• EXHUMATION  $\Rightarrow$  Digging out the dead body

• Early Morning hours

• No time limit. (can be done at any time after death)

• Preserve about 500 gm of earth in contact w/ body from 6 different site



$\Rightarrow$  Where the Poison diffuses the soil into the body

P.M. IMBEISSION (M/c  $\Rightarrow$  As Poisoning)

## POWER OF COURT (Sec 29 of P.C)

3

FINE

## IMPERSONATION

(I) MAHISURAFIE COURT

1. 2 <sup>nd</sup> CLASS JUDICIAL MAGISTRATE	5000/-	1 yr
2. 1 <sup>st</sup> CLASS JUDICIAL MAGISTRATE	10,000/-	3 yr
3. CHIEF JUDICIAL MAGISTRATE	No Limit	7 yr

(ii) SESSION COURT  $\Rightarrow$  Highest Court of District

1. ASSISTANT SESSION COURT 11 104r (4)

2. SESSION COURT " L.I. / Death sentence

(III) HIGH COURT  Confirmed by  
Highest court of State

(iv) SUPREME COURT  $\Rightarrow$  Highest court of Nation

Q. Lowest court who commits the decision?  $\Rightarrow$  High court.

Q. Who will grant the Amnesty?  $\Rightarrow$  President of India

II  
Full Paldan. (पुरा माठ)

High court  $\Rightarrow$  Law of State

Supreme court  $\Rightarrow$  Law of Nation

## EUTHANASIA / MERCY KILLING

### ACTIVE

- ⇒ M/c by "Drug Administration"
- ⇒ Not allowed in India till date

M/c used drugs  
"Phenobarbital"

### PASSIVE

- ⇒ Life support withdraw
- ⇒ Bombay High court legalise

Article 21 ⇒ Right to Life

"Netherlands" Legalise euthanasia  
firstly. (Both Active & Passive)

Judgement by supreme court,  
Allowed in whole Nation

Decision comes in "ARUNA SHABDA" Case 2011 (7th March)

Euthanasia May be :

⇒ All three are Not allowed in India

### Voluntary

- Patient wishes

### Non-voluntary

- Patient in coma

### Involuntary

- No patient (Pt. don't want to die; doctor concern say u r harmful to society should die)

- Why Euthanasia is Not Allowed ? CONSTITUTION

Article 21: Fundamental Right: "Right to Life":

COURT      PROCEDURE

① ⇒ Victim

↓  
Complain to the court.

Kta "COMPLAINANT / PLAINTIFF"

↓ Lawyer

PROSECUTOR

① ⇒ JUDGE



"SUMMON" to the person who was @ the crime scene

↓  
Defender

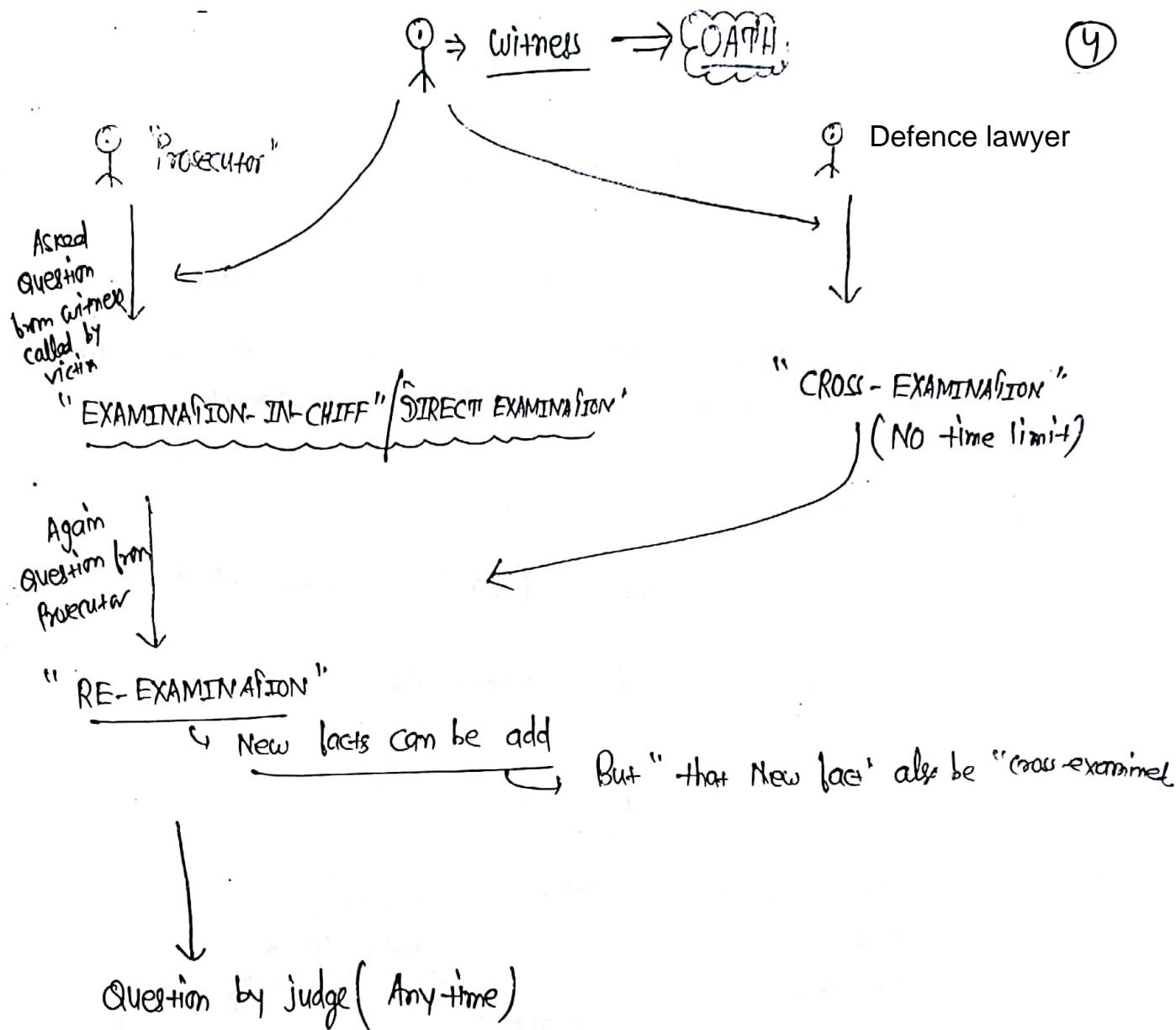
① ⇒ Accused

↓  
Defend himself

Kta "DEFENDANT"

↓ Lawyer

DEFENCE LAWYER



\* When witness called by "Defense Lawyer" then cross-examination done by Plaintiff; Re-examination / Examination-in chief by defence Lawyer

see 141

\* LEADING QUESTIONS → In cross-examination

↳ Answer is in Yes/No.

↳ Also Necessary in a wound certificate; A Medical certificate & a postmortem certificate (up to 3).

\* Regarding OATH: Out of oath evidence can't be recorded.

↳ 1842 → Take oath

\* False evidence under oath → "PERJURY"

↳ sec 191 I.P.C (definition)  
Punishment → 193 I.P.C (life imprisonment)

## SUMMON (S. 61-69 Cr.P.C)

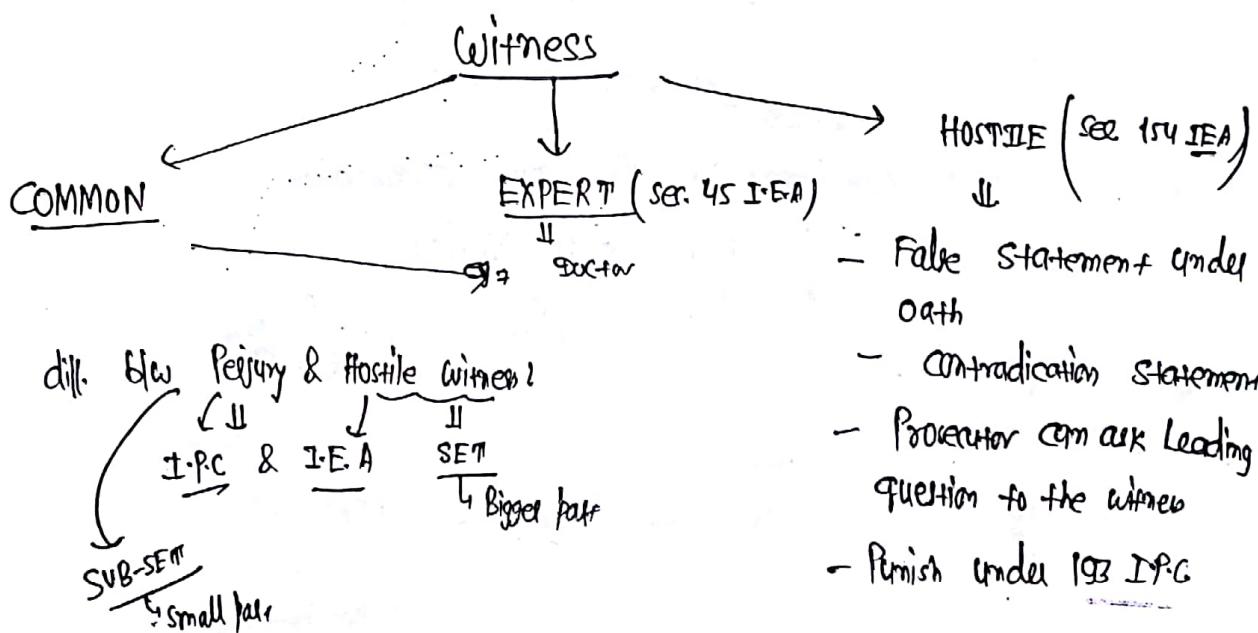
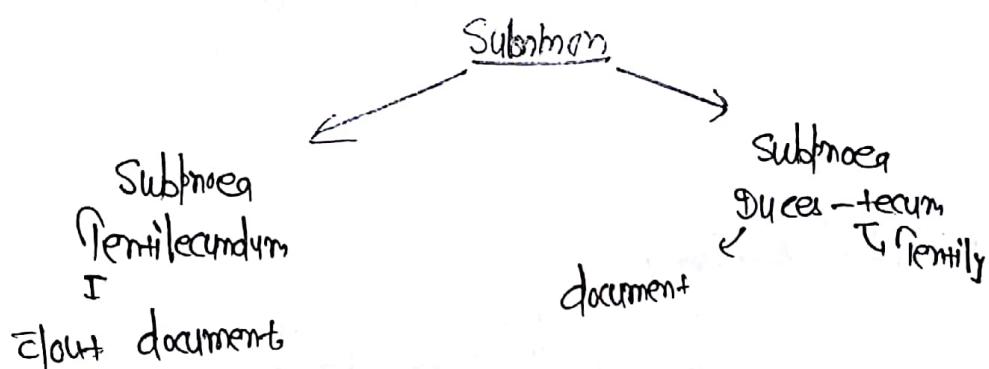
klas " SUBPOENA"  
Under Penalty  
↓

Both civil & criminal can Punishment.

Q. Higher court always have priorities than lower court; No matter what is the case "civil/criminal".

CONDUCT MONEY ⇒ Money given to attained Summon in civil cases.

DIET MONEY ⇒ In criminal cases



## Dying Declaration (See 32 I.E.A)

(5)

- Circumstances leading to death (Statement talking about)
- No oath
- Anyone can Record; Best Recorded by  
↓

Magistrate > Doctor > Police > civilian

all should Read out @ court; if individual gave dying declaration in front of all.

- if the patient survives; then it has "CORROBORATIVE VALUE"
- Role of Doctor  $\Rightarrow$  COMPROMISING (Pt. is fit for statement)

## Dying Deposition

- Witness gave Statement; whole court comes @ Hospital

b/c "Leading questions" allowed  
single best answer; who  
makes it better than  
dying declaration

Oath  
Cross-examination  
Re-examination  
EIC

- Not practice in India

- Dying deposition > Dying declaration

Q: ♀ died clin 4 years Under Suspicious circumstances! Autopsy?  
④ 304; ⑥ 302; ② 174 Cr.P.C ④ 176 Cr.P.C

Q: Power to Recall witness? Cr.P.C 311

Q: Evidence Recording in previous proceeding is relevant in subsequent proceedings?  
S.33 I.E.A. (Same Recording is relevant in future proceeding).

## NEGLIGENCE | PROFESSIONAL NEGLIGENCE

### PROFESSIONAL MALPRACTICE



Fined/Prison

Case would be decided by court

Civil  
(Tort)

Criminal  
↓

- Gross Negligence
- decide by supreme court of india
- illegal
- Gross inattention toward patient.
- Negligence that can't be compensated by Money.

4 D's  $\Rightarrow$

① DUTY; - Pt - Doctor Relation

② DERELICTION;  $\rightarrow$  You don't follow standard

③ DIRECT CAUSATION; - cause harm (direct)

④ DAMAGE.

\* If Doctor is Negligent; He is punished Under:

304 I.P.C  $\Rightarrow$  Negligent causing  $\rightarrow$  Death  
2yr ± fine

337 I.P.C  $\Rightarrow$  Negligent causing  $\rightarrow$  Hulf  
6months ± fine

338 I.P.C  $\Rightarrow$  Negligent causing  $\rightarrow$  Criminal Hulf  
2yr ± fine

See 269 I.P.C.  $\Rightarrow$  Negligent Regarding Infectious disease (6)

6 Months ± Fine

See 270 I.P.C.  $\Rightarrow$  Malignant Act Regarding Infectious disease  
With Intention 2yr ± Fine

\* Defences available to a doctor in a Negligence  $\Rightarrow$

① Corporate Negligence  $\Rightarrow$  Hospital has to provide  
Infrastructure & Manpower  $\begin{cases} \text{if Not, Hospital} \\ \text{is Negligent} \end{cases}$

② Products Liability  $\Rightarrow$  Manufacturer Negligence for his product.

③ Error of Judgement  $\Rightarrow$  You decide to go in the interest of Patient

④ Therapeutic Misadventure  $\Rightarrow$  Idiosyncratic Rxn to Drug  
अपनी रेखा से अवृद्धि की निया; but Something Not controllable,  
or Not in My Hand

⑤ Res Judicata / Doctrine of double Jeopardy  $\Rightarrow$   
कैदी चाला दो बार दो बार No Punishment,  
Rest the decision Rest.

⑥ Res Judicata - Limitation period ~ 2 yrs.  
If I am Negligent, then Pt. can file the case upto 2 yrs.

\* All Above defence can use @ civil / criminal both negligence

⑦ Contributory Negligence  $\Rightarrow$  Defence only in civil cases  
Both Patient / Doctor are responsible

Two ways to determine : Who is More Negligent

① Last clear chance

DOCTORINE  $\Leftrightarrow$  if the doctor fails to prevent

↓ damage resulting from the Negligent  
act of the patient; even after getting

Doctor is Responsible

clear time, he can't  
blamed (Contributory  
Negligence in civil case)

② Avoidable consequence

Rule

↓

Patient is Responsible

AIMS May 15

Q. Pt. comes to you  $\in$  large Laceration. You did Regular dressing. Pt. didn't give much care. During follow-up; patient was repeatedly told to get the dressing done timely but patient didn't do the dressing himself, saying that he was busy. Finally the wound enlarged & underlying bone developed osteomyelitis. Which of the following statement is true regarding above mention situation?

- a) Doctor is guilty under "Last clear chance" Doctrine
- b) Doctor is not guilty under "Contributory Negligence".
- c) Doctor is punishable under avoidable negligence
- d) Doctor is guilty as he prescribed wrong Medicine

Terms in Negligence : (I) RES IPSA LOQUISTER  $\rightarrow$

↓

Fact speaks itself.

(II)

VICARIOUS LIABILITY / RESPONDENTIUM SUPERIOR / CAPTAIN OF SHIP

DOCTORINE

↓

"HOD Medicine" (Captain)  
"Gatem" (Employee).

\* applicable only in civil  
Negligence Not in  
criminal cases

Let the superior Reply

the employer is responsible for Negligence of employee

↳ Hospital Responsible (Vicarious Liability)

DOCTORINE OF DEEP POCKETS  $\rightarrow$  उसकी पकड़ी गई पैसों की Pockets (Money)

BORROWED SERVENT DOCTORINE  $\rightarrow$

III

Novus ACTUS INTERVENIENS  
↓ ↓ ↓  
New Act Intervening.

⇒ Defence very commonly seen in  
Homicide

7

Usually Not accepted by the court;  
Unless the Doctor is confirmed,  
Negligent,

Head injury to the patient → Doctor came → Septicemia → Death

QNB May 2017

Compoundable offenses ⇒ These can be out of court settlements.

\* Non-compoundable offenses ⇒ These offenses can't be out of court settlements.  
↳ eg ⇒ Theft,  
↳ eg ⇒ Murder

\* SUMMON : Issued Under (S. 61-69 Cr.P.C)  
↳ (Not attended)

2nd Summon : (Again Not attended)

↳ NOTICE (S. 350 Cr.P.C)  
(Show cause Notice)  
↳ Again Not attend.

↳ eg ⇒ Son's Marriage (Social  
Heart attack)

↳ Valid Reason  
(No Punishment)  
↳ Invalid Reason  
(Punishment : Rs 100/-)

Bailable Warrant  
↳ Non-Bailable Warrant

Fine + Imprisonment

Q.

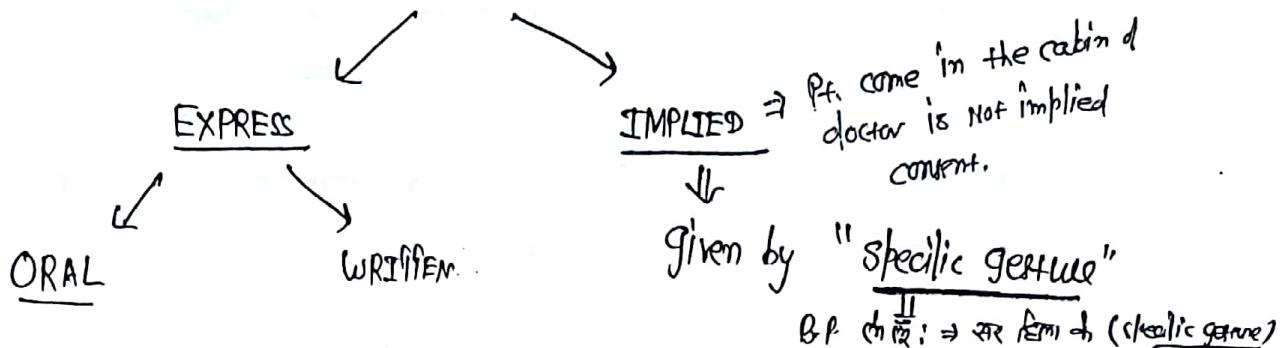
Burn pt.; ♀ by husband; treated ⇒ She goes into O.T. for plastic Sx - Anesthesia  
give Sch → Pt. dies on Sx table; who is Responsible?

- Ⓐ Anaesthesiology
- Ⓑ Surgeon
- Ⓒ Husband
- Ⓓ Surgeon d/c & Vicarious Liability

⇒ Pt. is blunt case; ∵ Sch is Not premeditated; also  
Anaesthesiologist is Not controlled by Surgeon.

## CONSENT

- Sec. 13 - Indian Contract Act, 1872
- Voluntarily Agreement



- All the consent is valid in court of Law.
- Consent should always be "Informed"

II

- You are telling Full disclosure to patient.
- except ⇒ "Therapeutic Privileged"

\* BLANKET CONSENT ⇒ Invalid in India

↳ Consent taken for everything together

\* Consent taken b/c of Assault ⇒ 35 I.P.C

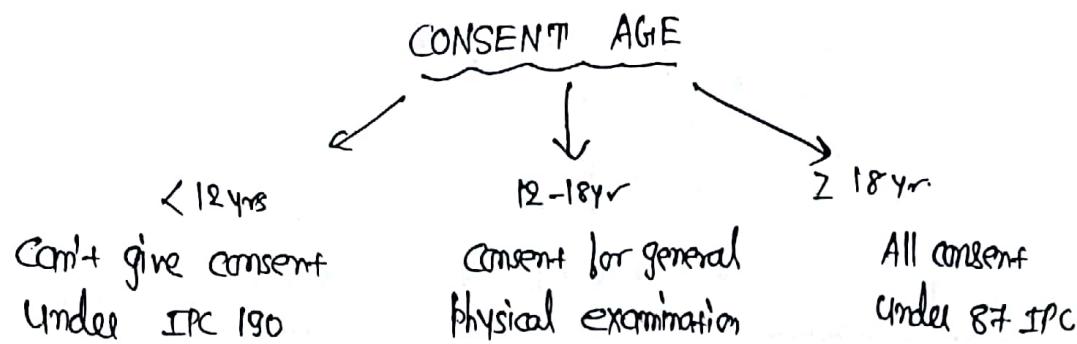
↳ Without consent

↳ except ⇒ protected under 92 I.P.C  
Emergency

↳ like saving Rx

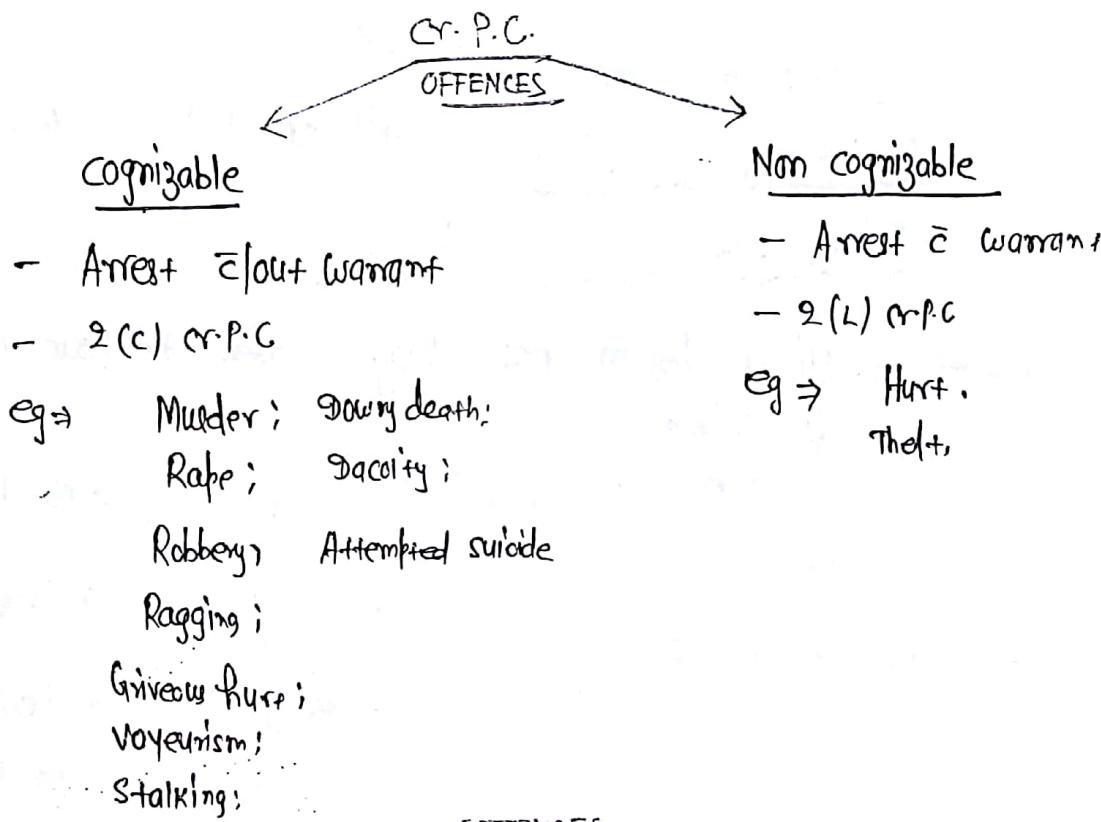
↳ Consent can't obtain w/out reasonable delay

e.g. RTA → Prolonged bleeding → Consciousness oriented → give No. consent,  
II  
Informed Refusal → No Rx.



91 I.P.C.  $\Rightarrow$  Consent for illegal Act is invalid  
 Eg  $\Rightarrow$  Murder  $\nrightarrow$  consent; Not valid (illegal)

### SECTIONS



I.P.C.

- Sec. 44 ⇒ Injury (Definition)
- Sec 46 ⇒ Death (Definition)
- sec 82 ⇒ Child < 7 yrs is Not Responsible  
Railways Act : child > 5 yrs is Responsible  
6 yr old: Punishable for Pulling chain; Not Responsible for killing
- Sec. 84 ⇒ Criminal Responsibility of Insane  
( Mc Naughten's Rule) / Legal test / Right or Wrong test

CURREN's RULE

DURHAM's RULE

Incredible impulse test

American Law Institute Rule

Federal Law



✗ Not applicable in India

→ all are Rule for Insane

⇒ If a person has Insight; then the person is Responsible for crime

e.g. Psychosis → Insight → (✓) ⇒ Not Responsible

Neurosis → Insight → (✓) ⇒ Responsible

Kleptomania → Insight → (✓) ⇒ Responsible

Delirium → Insight → (✗) ⇒ Not Responsible

Automatism → Not Responsible

Sleep Walking → Not Responsible

Hypnosis → Responsible

\* DURHAM's RULE ⇒ Accused is Not Responsible for the act; if his acts resulted from Mental disease or defect.

\* CURREN's RULE ⇒ A Person is not Responsible; if @ the time of committing the crime; he didn't have capacity in Realizing his conduct.

Sec 85

⇒

Act under

Involuntary intoxication

(9)

↓  
Person is Not Responsible

Sec. 86 ⇒

Act under

Voluntary intoxication

↓  
Person is Responsible

\* if crime done in Delirium tremens → d/t Alcohol withdraw.

↓  
Not Responsible

Sec. 88 ⇒ Act Not intended to cause death; but can cause death or grievous hurt; done by consent in good faith & for the benefit of that person eg ⇒ Death of pt caused by surgery done by surgeon

Sec. 197 ⇒ Issuing False certificate

↓  
Penal erasure → Punish ≤ 7yr

→ only Medical council; Not court.

Sec 201 ⇒

causing disappearance of evidence

↓  
Punishment = 2yr ± Fine

eg ⇒ Embalming clout Death certificate

↓  
Punishable under 201.

- Once a death certificate is approved it means person had already Post-Mortem

- Embalming agent ⇒ Methanol;

Formalin;

Phenol;

Glycerine etc

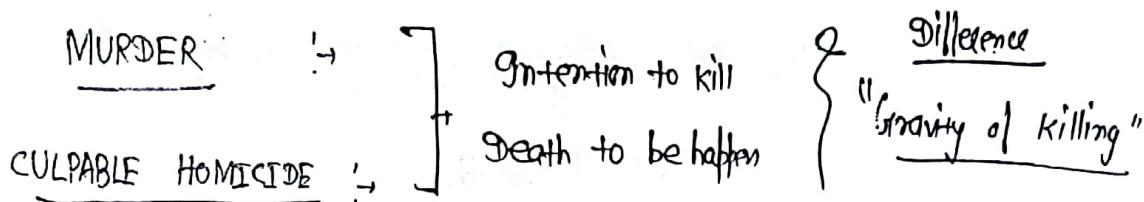
- Unclaimed Body ⇒ after 48 hrs

Sec. 299 ⇒ Culpable homicide (Definition)

Sec. 300 ⇒ Murder definition

Sec. 302 ⇒ Murder (Punishment)

Sec. 304 ⇒ Culpable Homicide (Punishment)



Sec. 307 ⇒ ATTEMPT TO MURDER → Intention high; Dead not happen.  
↳ 10yr Impersonation + Fine

Sec. 308 ⇒ ATTEMPT TO CULPABLE HOMICIDE → Intention less; Dead not happen.

↳ 3yr Impersonation + Fine

Suicide

Aberement (बक्षण)

- Provoke for Suicide
- Punish in 306 I.P.C

Attempt

- Punish in 309 I.P.C
- 1 Yrs Punishment
- Non cognizable offence
- Not Required to Report the Police

G 8/c Sec. 39 Cr.P.C

↳ Public to give Information of certain  
Offences; Not talk about 309 I.P.C

\* Gravity of killing is determined by Nature of actions of Accused ↴

Eg ⇒ Stab once & Run Away: chance of survival: Culpable Homicide  
Stab so Many times: No chance of survival: Murder.

Sec. 312-316  $\Rightarrow$  Criminal Abortion

10

expulsion of product of conception before full term according to Law

Sec 312 : Abortion  $\equiv$  consent { Death of (Death during  
↓  
Sec. 313 : Abortion  $\neq$  consent } 314 I.P.C Abortion

Sec. 315 : Infanticide ↗ Moment in ⑨ ; When the ⑨ woman starts to feed or perceives

sec. 316 : Causing death of a quick Unborn child; while trying to kill Mother: (culpable Homicide)

tryng to kill Mother. (culpable homicide)  
quickeening in primi 20 weeks

• quickening in primi  $\Rightarrow$  20 weeks

Quickenings to Multiples 16-18 wks

### Sec 315. : concealment of child

↳ Any birth/ death should be reported within 21 days.

Sec 319 : HURT ( DEFINITION )

SEC 320 : GRIEVOUS HURT (DEFINITION) : 8 clauses ↗

(A) Emasculation / Impotence (Applicable only to Males);

③ Permanent privation of sight of either eye  
(5.1/10.1/100)

Chemistry Not healing itself; do Sx.

(C) Permanent privation of hearing of either ear

⑨ Privation of Member / joint [ Anything that has its own functions ]  
Member of body.

(E) Permanent destruction / impairment of Power of Member / joint

(F) Permanent disfigurement of Head & face

⑥ Eg. 60 yr old & 20 yr Model: shape of Head? No one is given a tooth.  
# dislocation of Mandible (Bone) tooth.

(H) Any Hurt that endangers life or causes severe bodily harm for 20 days or  
 ↓  
 Unable to follow ordinary Pursuits  
 ↓  
 Profession is Not ordinary Pursuits.

Any injury; where death can happen

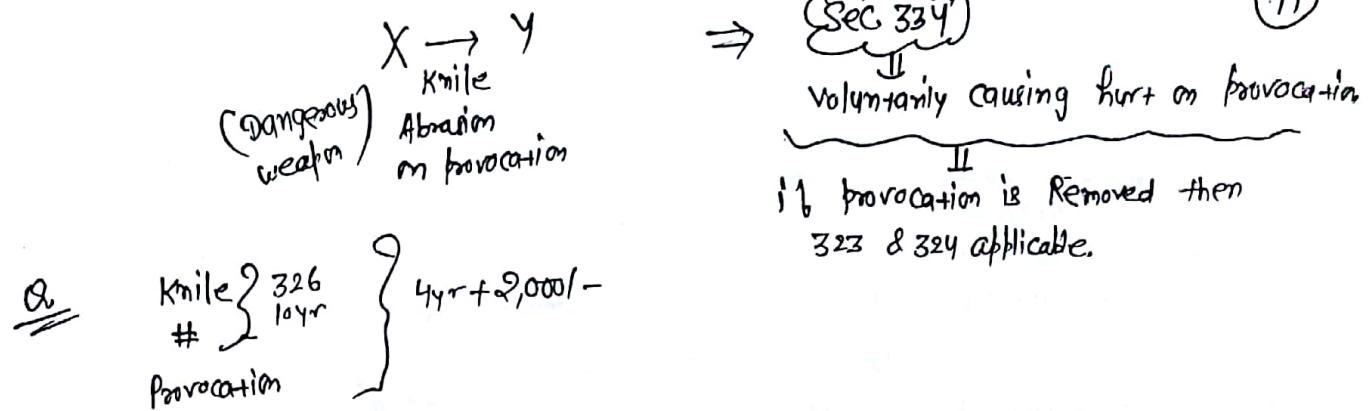
DANGEROUS INJURY  $\Rightarrow$  Any injury; which causes threat to life  
 ↓  
 Part of Griveous Hurt.

- \* Sec. 323  $\Rightarrow$  Punishment for voluntarily causing Hurt; Punish = 1yr
- \* Sec 324  $\Rightarrow$  Punishment for voluntarily causing Hurt by dangerous weapons  
 ↓  
 Punishment  $\Rightarrow$  3 yrs.
- \* Sec. 325  $\Rightarrow$  Punishment for voluntarily causing Griveous Hurt  
Punishment  $\Rightarrow$  7 yrs
- \* Sec. 326  $\Rightarrow$  Punishment for voluntarily causing Griveous Hurt by dangerous weapons; Punishment  $\Rightarrow$  10 yrs
- \* Sec. 334  $\Rightarrow$  Punishment for voluntarily causing Hurt on Provocation  
Punishment  $\Rightarrow$  1 month + 500/-
- \* Sec 335  $\Rightarrow$  Punishment for Griveous Hurt on provocation  
Punishment  $\Rightarrow$  4 yrs + 2000/-

Dangerous weapons  $\Rightarrow$  Shooting / Stabbing / cutting

X  $\xrightarrow{\text{Stick; Bruise}}$  Y (Bruise)  
 (Not dangerous) on provocation  $\downarrow$  Hurt  $\Rightarrow$  Sec 334

voluntarily causing  
 Hurt on provocation.



Q. ATTEM

X → Y

Shouts;  
Intention to kill;  
thigh → Bleeding

1. 324

2. 326

3. 335

4. 304

1. 324

2. 326

3. 307

4. 308

Sec. 351 : Assault to outrage the Modesty of female  
by Force

see 509 : Insult to outrage the Modesty of female  
by words (obscene comments)

Amendment in 2013 :-

354(A) : Sexual Harassment

354(B) : Disobedient a ♀ in Public

354(C) : Voyeurism

354(D) : Stalking

Physical  
(पीड़ा करना)

Digital

via what's app ; email

for the 1st offence : upto 3 yr jail (cognizable & Bailable)

for the 2nd offence : upto 5 yr jail (cognizable & Non-Bailable)

## Sexual Offences

### Natural

- Intercourse is per Nature i.e. Male intercourse & Female or vice-versa
- Penis penetrate vagina

eg ⇒ Rape;

incest - Not offence in India

Adultery ⇒ Sec 497 IPC

↳ Male Punish

### UnNatural (377 IPC)

- Against Nature
- Men & Animal
  - ↳ Bestiality
- & I'm the same gender
  - ↳ Homosexual
- Penis penetrating Anus orifice
  - ↳ Sodomy
- Penis in oral orifice
  - ↳ Buccal coitus / sex of Horns

### Sexual Preservation

RAPE → Sec. 375 I.P.C (Definition)

↳ 2013 Amendment

Age of consent ⇒ 18 yr (Married / Unmarried)

Statutory Rape ⇒ Sexual intercourse < 18 yr.

♀ → Rape → (X) ⇒ Not charged in India

↳ Gang Rape → (X) ⇒ Not charged in India  
↳ > 1 Person

Sec. 376 I.P.C ⇒ Rape Punishment

↳ 7 yr. — Life Imprisonment  
↳ Rest of Life

sec. 376(A)  $\Rightarrow$  Death occurred

$\Downarrow$

Give Death Sentence to accused

1. victim - Death
2. victim - Persistent vegetative state  
 $\downarrow$   
coma  $\rightarrow$  cortical Brain death,

sec 376(B)  $\Rightarrow$  Husband - wife clout consent during separation  
 $\Downarrow$

2-7 yrs. Bailable (only bailable Rape)

Marital Rape  $\Rightarrow$  No punishment in India.

$\hookrightarrow$  Husband has power to call sex after Marriage  
- If you have to answer clout option; No offence; then select 376B.

sec 376(c)  $\Rightarrow$  Sexual Intercourse by a person in Authority

$\Downarrow$

Punishment  $\Rightarrow$  5-10 yr

sec 376(d)  $\Rightarrow$  Gang Rape

$\hookrightarrow$  Punishment  $\Rightarrow$  20 yr - L.I.

sec 376(E)  $\Rightarrow$  Death Sentence to accused if he is a Repeat offender.

Sec. 53(A) Cr.P.C  $\Rightarrow$  Medical examination of Rape accused

- No Need of Consent
- Request of Medical examination  $\geq$  Sub-inspector

Sec. 164(A) Cr.P.C  $\Rightarrow$  Medical examination of Rape victim

- Consent Required
- for consent  $\geq$  12 yrs in this case
- Male/Female both doctor can examination in presence of Female attendant.
- Test  $\Rightarrow$  I.i. Toluidine blue  
II  
to visualize Micro-laceration
- Lugol's Iodine  
II  
can be used for Max<sup>m</sup> 4 days after intercourse

Sec. 327 Cr.P.C  $\Rightarrow$  In "camera trial" done in Rape cases

Misnomer  $\Rightarrow$  Limited people allowed in court,

Sec. 228(A) I.P.C  $\Rightarrow$  Punishment of disclosing the identity of Rape victim

- Punishment  $\Rightarrow$  2 yr.

## UNNATURAL SEXUAL OFFENCE

(13)

Male homosexuality

Female homosexuality

Klæs" Tribadism; Lesbism"

Active

Klæs "Butch/Dyke"

Bull Dyke"

Passive

Klæs "Femme"

\* SODOMY / BUGHERY / ANAL INTERCOURSE  $\Rightarrow$  "Greek Love"

ACTIVE

- Preferred children

Klæs "Pedestrian/Pedophile"

PASSIVE

$\Rightarrow$  child  $\Rightarrow$  Klæs "Catamite"

Act Klæs  
"PEDIOPHILIA"

$\rightarrow$  if old age  $\Rightarrow$

"GERONOPHILIA"

\* SIN OF GOMORRAH (BUCCAL COitus)  $\Rightarrow$  Fellatio  $\Rightarrow$  oral stimulation of Penis;  
Cunnilingus  $\Rightarrow$  oral stimulation of female genitalia

\* Feature of Habitual Passive agent

① Lateral buttock traction test  $\Rightarrow$   $\oplus$

$\hookrightarrow$  In knee/elbow position; Anal sphincter is completely Relaxed  $\Rightarrow$   $\oplus$

② Type's sign  $\Rightarrow$   $\oplus$

$\hookrightarrow$  Bluish discoloration seen around Anal Margin & /  
dilatation of vessels

③ Skin tags are present;

④ Funnel shaped Anus;

⑤ Skin will be shaved.

## Sexual Perversion | Paraphilia

- Sexual gratification ~~else~~ out of intercourse

SADISM  $\Rightarrow$  Pain  $\rightarrow$  Partner;

MASOCHISM  $\Rightarrow$  Pain  $\rightarrow$  Self

$\hookrightarrow$  Seen in "Autoerotic Asphyxia"

Co-existing together  $\Rightarrow$  "BONDAGE"

FETICISM  $\Rightarrow$  Object of desire

$\hookrightarrow$  PARTIALISM  $\Rightarrow$  Desire for part of body.

Klismaphilia  $\Rightarrow$  Pleasure by use of enema.

Urophilia / Urinism  $\Rightarrow$  Pleasure by sight / Urine / making a person urinate on self.

Cotitulalia / Scotophilia  $\Rightarrow$  Pleasure by obscene language

Masturbation / Ibsation / Onanism  $\rightarrow$  Punishable act; if done in Public; otherwise Not.

Punishable sexual Perversion

Exhibitionism  $\Rightarrow$  display of private part in Public  
 $\hookrightarrow$  Under 294 I.P.C

Frotteurism  $\Rightarrow$  Rubbing against private part of unsuspecting individual in Public

$\hookrightarrow$  Under 354 / 354(A) / 290 I.P.C

Necrophilia / Necrophagia  $\Rightarrow$  297 I.P.C  $\Rightarrow$  Showing disrespect to a dead body  
 $\frac{\text{Love}}{\text{II}}$   $\frac{\text{eat}}{\text{II}}$   $\hookrightarrow$  1yr & fine

Voyeurism | Scotophobia | Peeping tom  $\rightarrow$  Pleasure by watching other (14)  
people in intercourse or by watching undress.

↳ Under 354(c) I.P.C

1<sup>st</sup> offence  $\Rightarrow$  1-3 yr (cognizable bailable)

2<sup>nd</sup> offence  $\Rightarrow$  3-7 yr (cognizable Non-bailable)

TRANSVESTISM / EONISM  
III II  
cross Dressing

- Individual identity himself as opposite gender
- Not perversion - Gender Misidentity disorder
- Mc in ♂.

Sec. 497 : Adultery (i.e. voluntary sexual intercourse b/w a Married Person & a person ; Married or Not ; other than his/her spouse).

Sec 498(A) : Cruelty on a ♀ by husband / Relatives

↳ Not on ♂.

Q: ♀  $\rightarrow$  4 yrs under marriage  $\rightarrow$  ♀ Autopsy ?

① 304 B I.P.C

③ 174 I.P.C

② 302 I.P.C

④ 176 I.P.C

Q: Power to Recall a witness ?  
Under Cr.P.C (311)

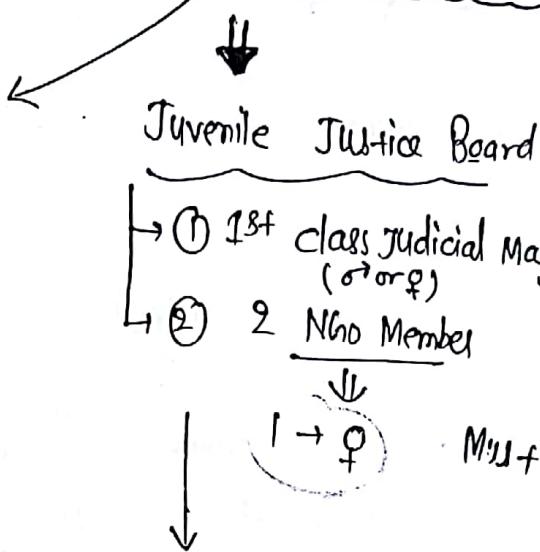
Q: Evidence Recorded in lower court ; is applicable in higher court ?  
Under I.E.A. (33)

## JUVENILE JUSTICE ACT, 2000

Juvenile; child; Minor  $\Rightarrow$   $< 18$  yr.

Juvenile in crime  $\Rightarrow$  Juvenile - In-conflict w/Law (JCL)

That Means any Juvenile offender  
juvenile delinquent. He is called  
"JCL" & is never sentenced to  
death/imprisonment.



Reformatory / BOASTAL

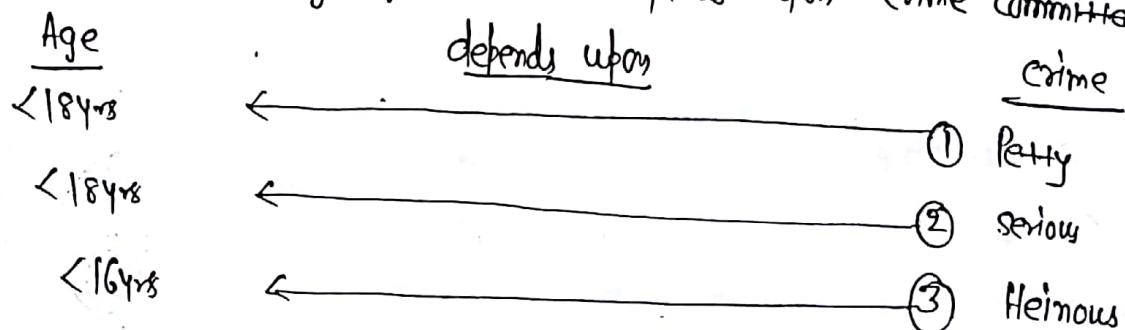
↳ Age upto 21 yrs Maxm

Maxm Punishment  $\rightarrow$  3 yrs.

- Amended 2015;  $\Rightarrow$  Maxm Punishment  $\Rightarrow$  Death Sentence

Age of Juvenile depends upon crime committed,

depends upon



Petty Crime Punishment  $\Rightarrow$   $\leq 3$  yr - e.g. 323 Ipc

Severe  $\Rightarrow$  3 yr - 7 yr - e.g. 924, 245TC

Heinous  $\Rightarrow$   $\geq 7$  yr

# TRANSPLANTATION OF HUMAN ORGAN & TISSUE ACT, 2011

(15)

Brain stem death

Live individual

• Definition ⇒ Section 2(9):

• Criteria ⇒ Minnesota

Team of Doctors ↗

Hospital in charge (HIC):

(2) Specialist appointed by  
HIC;

(3) Independent Neurologist / Neurosurgeon

(4) Treating Doctor

→ All are Not part of operating  
Team

NEXT OF KIN

↓

Grand parent

↑ Parent

① → spouse

↓ Child

↓ Grand child

Punishment ⇒ to Doctor

{ 10 yr + 20 Lac to 1 crore }

• MCI can Remove for 3 yr → 1<sup>st</sup> offence

Permanent + 2nd offence

## INDIAN LUNACY ACT, 1912

• Replaced by Mental health act 1987

• Replaced by Mental health care act, 2017

• ① ECT → pre-treated ≡ Muscle Relaxant.

ECT in child → Permission from Medical Review Board (MRB)

• ② Advance directions are allowed for a future Medical illness  
↓  
Override ⇒ MRB

③ 309 I.P.C  $\Rightarrow$  Non-cognizable offences.

### Medical Review Board

People in MRB

$\Rightarrow$  ① District Judge

② Representative of District Collector

③ 2 Doctor  $\begin{cases} \text{Psychiatrist} \\ \text{Any Registered Practitioner} \end{cases}$

④ 2 People from NGO

If Doctor violates this Law

Punishment  $\Rightarrow$  6 month  $\pm$  10,000 - 1st offence

2 yr  $\pm$  50,000 - 5 lac - 2nd offence

### Consumer Protection Act, 1987

We can file the case at.  $\rightarrow$  ① District forum;

② State commission;

③ National commission;

### District Forum

3 Member

Jurisdiction

Care value upto < 20 lakh

### State commission

3 Member

20 lakh - 1 crore

### National commission

5 Member

> 1 crore

Not happy

States Not happy

National Not happy

↓  
Go to Supreme Court

— Limitation period for filing a case in 2 yrs. (16)  
 — case decided in 90 days.  
~~Ex~~ After decision appeal in 30 days.

CORPUS DELICTI — Body of offense / essence of crime

① DETERMINE SPECIES → Precipitin test  
 ↳ Species identification test.

② DETERMINE RACE → ③ SKULL :

CEPHALIC INDEX → Maximum Breadth of skull

Maximum Length of skull × 100

↗ Long-headed  
CEPHALIC

MESATICEPHALIC

↗ Short-headed  
BRACHYCEPHALIC

cephalic index ⇒ 70-79%.

75-80%

80-85%

eg ⇒ Pure Aryans;  
Negro

Indian

Mongoid

④ DEFINITION ⇒ Mongoid ⇒ i) Fluoro dentism (Bull tooth);  
 ii) Shovel shape incisor  
 iii) Absent 3rd Molar  
 iv) Enamel pearls

Caucosoids  $\rightarrow$  i) Pointed canine roots;  
 ii) Carabelli's cusp  
 ↳ extra cusp on Maxillary 1<sup>st</sup> Molar

Negro  $\rightarrow$  i) Large teeth  
 ii) Multiple cusp.

(III) DETERMINE GENDER  $\rightarrow$  Best from Pelvis

Pelvis  $\rightarrow$  95% (Best)

Skull  $\rightarrow$  90%.

Long bones  $\rightarrow$  80%.

Pelvis + skull  $\rightarrow$  98%.

All bones  $\rightarrow$  100%.

Sternum

i) ASHLEY'S RULE  $\Rightarrow$  Manubrium + Body



$$\frac{\geq 149 \text{ mm}}{\text{♂}}$$

$$\frac{\leq 136 \text{ mm}}{\text{♀}}$$

ii) Sternal index  $\Rightarrow$

$$\frac{\text{Manubrium}}{\text{Body}}$$

$$\begin{array}{ll} \text{♀} & \text{♂} \\ 0.54 & 0.46 \end{array}$$

(IV) DETERMINE STATURE  $\rightarrow$  Stature  $\Rightarrow$  Bony Length of individual.

Length of bone is Measured by  $\Rightarrow$  "Hobson's Osteometric Board"

Length of bone  $\times$  M.F  $\Rightarrow$  Stature

BONE

FEMUR

⇒

M.F

3.6

TIBIA

⇒

4.4

FIBULA

⇒

4.4

HUMERUS

⇒

5.3

ULNA

⇒

6

RADIUS

⇒

6.4

This Multiplication factor  
is known "KARL PEARSON CO-  
EFFICIENT!"

\* Bone

Humerus

Tibia

Femur

Spine

1. of Height

20

22

27

35

→ 2<sup>nd</sup> Method to determine status ⇒ "Trotter & Glaser Method"

Discovered by ⇒ Sir William Herschel / Sir Francis Galton

(V)

Finger printing / Dactylography / Dermatogly

DNA Fingerprinting discovered by ⇒ Sir Alec Jeffreys

(N) Routine F/P ⇒ Better than digital F/P  
↳ even different in identical twins

Guettet's RuleLoopsWhorlsArchesComposite

67%

25%

6-7%

1-2%

M/C

- 2 set of F/P Need to identify.
- 8 points should Match in India; varies w.r.t. country  
↳ No Matter complete / Partial F.P.
- Little finger print - Both -  Not taken
- Dermis - depth - 0.6mm

- Finger print absent in - Leprosy;  
Irradiation & electrical injury.
- CALLIGRAPHY → Study of Hand writing.
- POROSCOPY → Study of pores on epidermal ridges
  - Primarily used in partial finger print
  - Developed by "LOCARD EXCHANGE PRINCIPLE"
- PALATOPRINT → Taken from Ant. 1/3rd of Palate
  - ↳ Rugoscopy
- CHEILOSCOPY → Lip prints
  - Tsuchi Hashi classification
    - ↳ 6 types
- ANTHROMETRY → By "BERTILLON SYSTEM"<sup>DNB 17</sup>
  - ↳ Body Measurement
  - ↳ Mostly axial / Lt. side except → one from Rt. ear
  - Only in Adults (Not for child)
  - No biological specimen Required
  - earliest criminal identification system.
- SUPERIMPOSITION TECHNIQUE → Skull bone
  - ↳ +ve test is said better in this technique
- IDENTIFICATION BY AGE →
  - ① By Secondary sexual character
  - ② By dentition
  - ③ By ossification centre

## 2<sup>o</sup> sexual character

- Tanner's sexual Maturity Rating

↑  
In Pediatrics

## Ossification centre

By definition

- 18<sup>+</sup> to ossify
  - ↳ clavicle (5<sup>th</sup> week gwl)

- 2<sup>nd</sup> Mandible  $\Rightarrow$  6<sup>th</sup> week gwl

- calcaneum - 5<sup>th</sup> week of gwl

- Talus - 7<sup>th</sup> week of gwl

- Lower end of Femur - 9<sup>th</sup> week of gwl (just before birth)

## Ossification centre @ birth

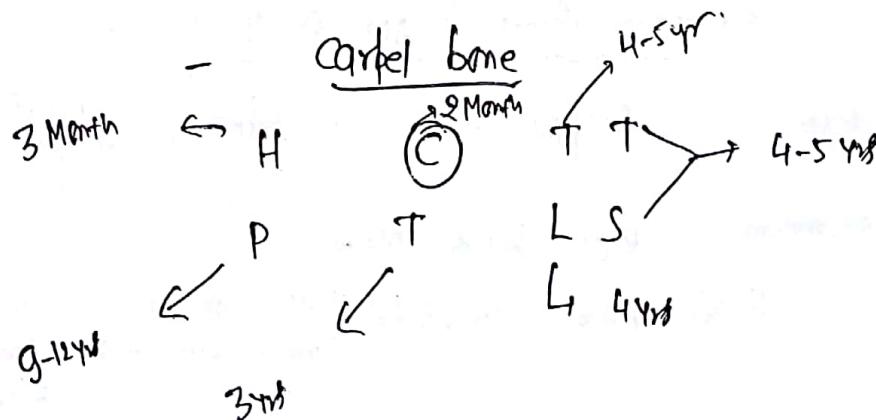
- cuboid
- 4<sup>th</sup> part of body of sternum
- upper end of tibia

## Ossification centre @ 1yr

Head of humerus / Femur

Lower end tibia / Fibula

Capitulum

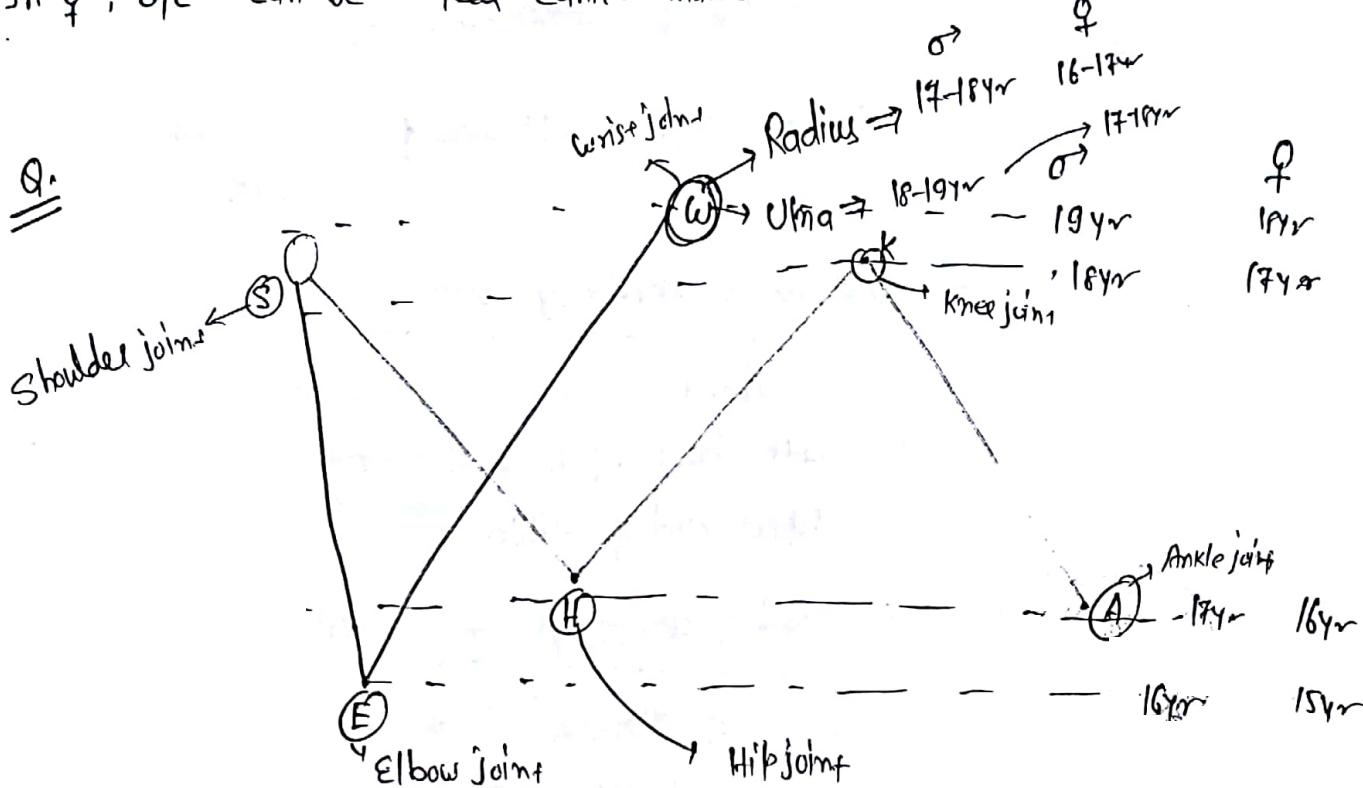


## Ossification centres around Hip

(A)  $\Rightarrow$  Appearance  
(F)  $\Rightarrow$  Fusion

	$\sigma$	$\sigma$
ILIAC CREST	(A) $\Rightarrow$ 14 yr (F) $\Rightarrow$ 18-20 yr	13 yr 17-19 yr
ISCHIAL TUBEROSITY	(A) $\Rightarrow$ 16 yr (F) $\Rightarrow$ 20-21 yr	15 yr 19-20 yr

in  $\sigma$ ; o/c can be 1 year earlier than  $\sigma$ .



## DETERMINATION OF AGE BY DENTITION

- Stack's Method  $\Rightarrow$  6th upper tooth  $\Rightarrow$  Infants (Age of infants can be known from height & weight of existing teeth)
- Boyd's incremental  $\Rightarrow$  Kline "Boyd's Method".  
Line  $\hookrightarrow$  Body's enamel. In children there is a line @ birth on enamel of teeth; with age; more lines are added)
- Eruption
- Hultaforsen Method  $\Rightarrow$  Determined @ age  $> 21$  yr.

Eruption → Tooth  
Temporary → I C PM  
                                  2 1 0 2 = 20

Permanent → 2123 = 32 total

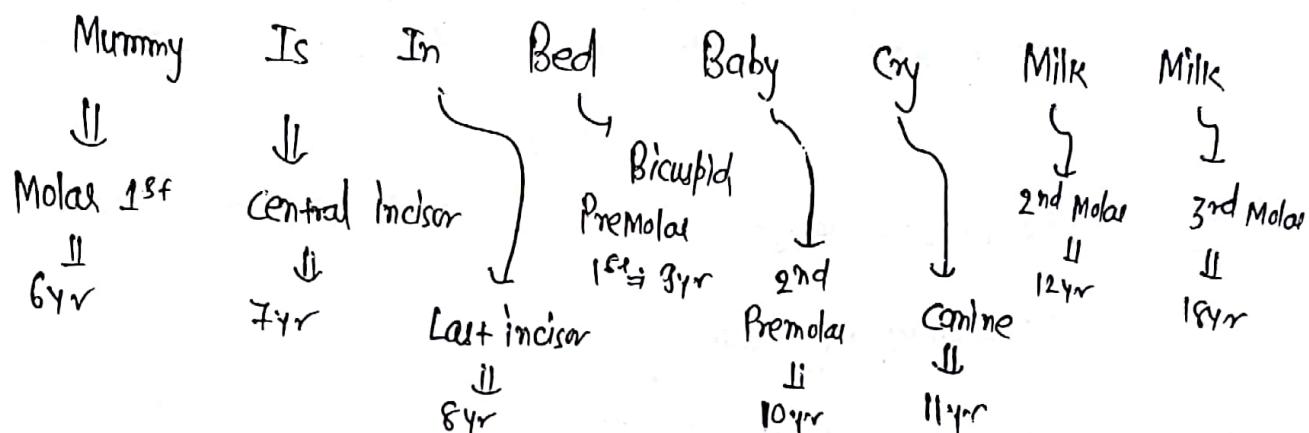
18+ temporary tooth to appear - Lower central Incisor

Last temporary tooth to appear = 2nd Molar.

18+ Permanent tooth to appear - Molar

464n

Permanent dentition  $\Rightarrow$



Mixed Dentition (6-12yr)  $\Rightarrow$  Both Temporary + Permanent

30 months ( $2\frac{1}{2}$  yr)  $\Rightarrow$  teeth = 20 in No.

$$\textcircled{a} \quad 6y_{18} + 4 \quad \Rightarrow \quad \text{feet} \approx 24 \text{ in No.}$$

$$@ \text{ (First Model)} \quad 12 \text{yr} + 4 \quad \Rightarrow \quad \text{feeth} = 28 \ln \text{ No.}$$

$$\textcircled{2} \quad \begin{array}{c} \text{(2nd Molar)} \\ 184v + 4 \\ \text{(3rd Molar)} \end{array} \quad \Rightarrow \quad \text{teeth} = 32 \text{ in No.}$$

$$* \quad \text{No. of Permanent teeth} \Rightarrow (\text{Age} - 5) \times 4 \quad \frac{\text{start}}{\text{apply}}$$

if Ans.  $\frac{11}{4}$  comes from this; then apply  
 $(Age - 6) \times 4$  ) + 2nd apply

Mc extra permanent tooth  $\Rightarrow$  Maxillary central Incisor

\* GIUSTAFSON METHOD  $\Rightarrow$  used in  $> 25$  yr age

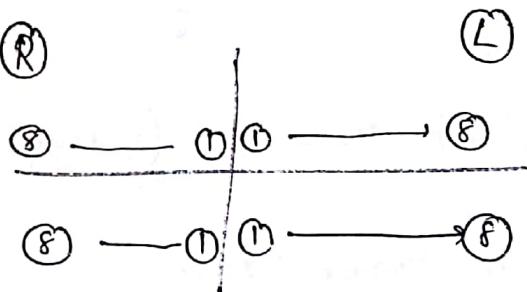
- i) Attrition : Top part (Grinding part)
- ii) Parodontosis : Recession of gingiva;
- iii) 20 Dentine : 2nd Most Reliable parameter; Full cavity Material
- iv) Cementum opposition : Root part
- v) Root Resorption : Least Reliable Parameter
- vi) Root Transparency : Most Reliable parameter
- Anterior teeth  $\gg$  Posterior teeth for determination  
(Mc  $\gg$  P/M).

### DENTAL NOTATION METHOD

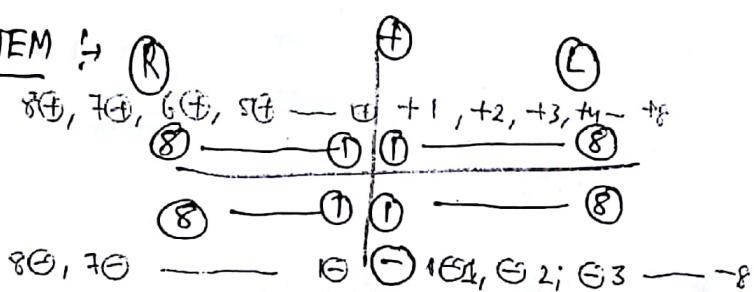
I. UNIVERSAL SYSTEM

II. DIAGRAMMATIC SYSTEM

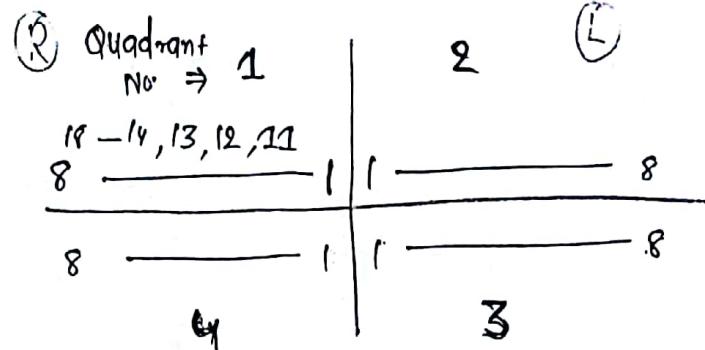
III. PALMER'S SYSTEM  $\Rightarrow$  (R)



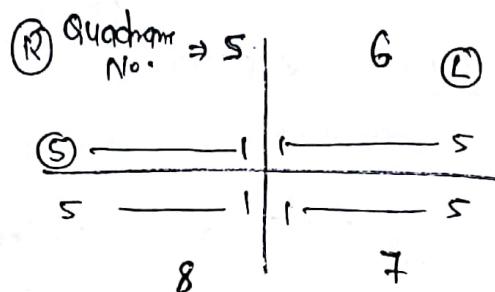
IV. HADERNUP SYSTEM  $\Rightarrow$  (R)



V. FDI SYSTEM (Federation Dentale International)  $\Rightarrow$  2 digit Notation



Quadrant No.  $\Rightarrow$  1, 2, 3, 4  
Used for Permanent Dentition



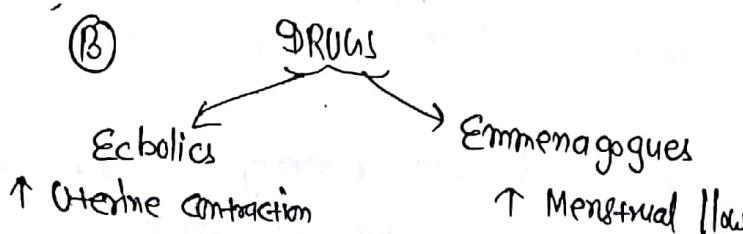
Temporary dentition

- \* Miles Method  $\Rightarrow$  Age can be known by change of Root to maturity.
- \* METHOD OF CRIMINAL ABORTION  $\Rightarrow$

(A) Abortion Stick  $\Rightarrow$  Irritant Plant + calotropis



Reflux Uterine contraction



(C) M/c complication of criminal Abortion  $\Rightarrow$  Hemorrhage

M/c immediate cause of death  $\Rightarrow$  Shock

M/c delayed cause of death  $\Rightarrow$  sepsis

416 Cr.P.C  $\Rightarrow$  Commutation of Death Sentence of ♂ Lady.

\* If a ♂ Lady; she can't be hanged during/ after delivery.

Death sentence will automatically change to Life Impersonation for that offence

## \* Difference b/w Male & Female Pelvis $\Rightarrow$

♀

♂

- Wide outlet
- Shallow cavity
- wide outlet
  - ↳ Sub-pubic Angle obtuse
  - ↳ Ischial tuberosity are elevated
- Chilotic Line
  - ↳ Pelvic component > Sciatic component
- Coccyx  $\Rightarrow$  More Movable
- Preauricular  $\Rightarrow$  More; Frequent, broad
  - Sulcus & deep
- Attachment of Anterior Sacroiliac Ligament.
- Gluteal-rectineal  $\Rightarrow$  Rounded & Smooth Line
  - well Marked & Rough

$\Downarrow$

① Lying;  
② After death d/t Loss of Muscle tone;  
n of Large joints;

\* Stature (Body Length) is More in  $\Rightarrow$  ① Afternoon & evening d/t loss of elasticity of intervertebral disc & Longitudinal vertebral Muscle;  
② Both Malnutrition & Advancing age

\* 1st ever finger print bureau in the world  $\Rightarrow$  Calcutta

\* Types of Fingerprinting : 1. Latent  $\Rightarrow$  Which can't be seen  $\in$  Naked eye;  
2. Visible  $\Rightarrow$  Can be seen  $\in$  Naked eye;  
3. Plastic  $\Rightarrow$  type of visible finger print which is seen in plastic substance (like wax etc.)  
4. Chance  $\Rightarrow$  Not a type of finger print; used for crime investigation.

\* In child: Foot print is taken  $\Rightarrow$  develops by 12-16 wk of GUL.

## \* TATTOO MARK

Commonly used dyes  $\Rightarrow$  Indian ink; Prussian blue; Vermilion; carbon; Indigo; cobalt.

(21)

- Tattoo Mark is permanent

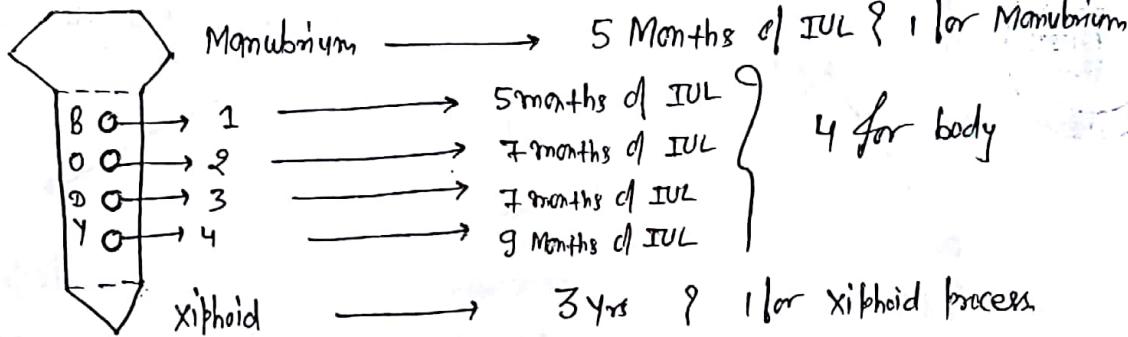
↳ When dyes penetrate the dermis.

AI+G Infrared Photo-graphy makes old tattoo readily visible

NEE16 A faded tattoo mark become visible by use of Ultraviolet Lamp;

AI+G Marks are recognized even in the decomposed bodies; when the epidermis is removed

## \* Sternum ossification centre



\* Manubrium fusion  $\equiv$  Body: 60-70 yrs.

\* Xiphoid fusion  $\equiv$  Body: 40 yrs

\* 14 yr  $\rightarrow$  25 yr.  $\Rightarrow$  Lower to upper body fusion  
(Started) (complete)

## \* Temporary tooth Eruption

$$2\frac{1}{2} \text{ yr} = 20$$

(All temp. teeth by 30 months)

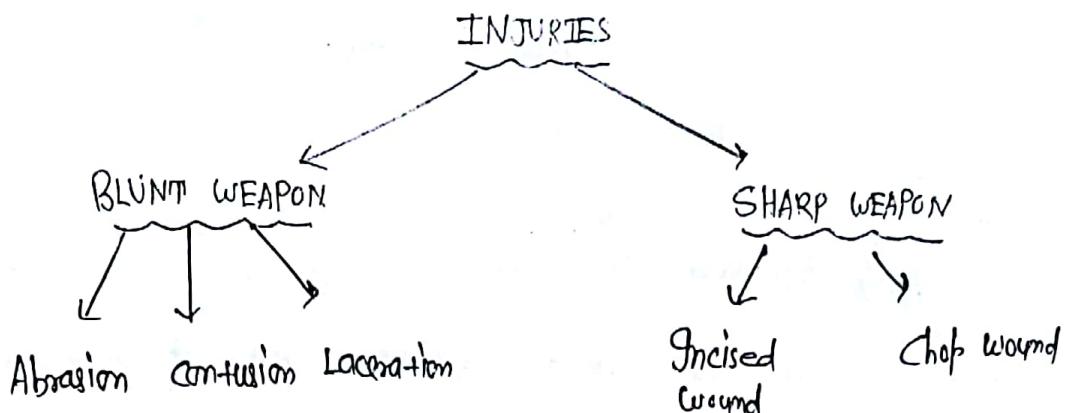
7-9M	7-9M	C	12-14M	20-30M
I	I	C	M	M
6-7m	10-12m	17-20m	12-14M	

\* "Super added permanent teeth"  $\Rightarrow$  6 Permanent Molars; which erupt extra in each jaw clout Replacing Any teeth.

\* Successional permanent teeth  $\Rightarrow$  All other permanent teeth except superadded permanent teeth.

\* In both, deciduous & permanent teeth, dentition occurs earlier in the lower jaw except  $\Rightarrow$

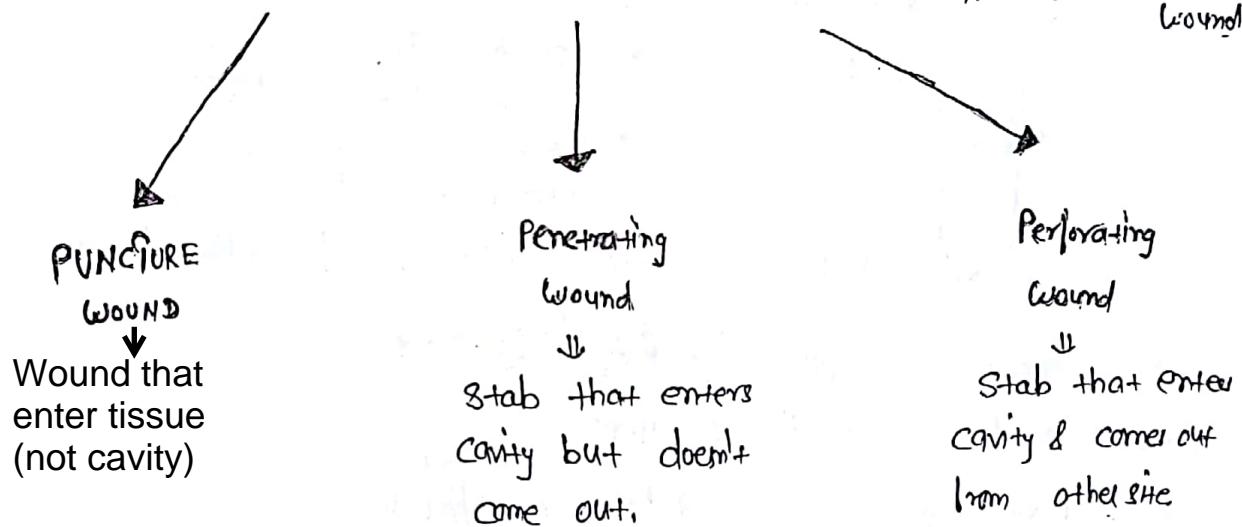
## MECHANICAL INJURIES



Stab wound  $\Rightarrow$  Depth  $>$  length or breadth of wound

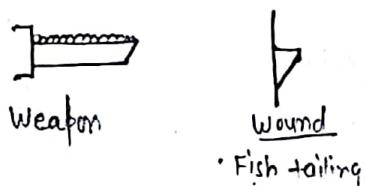
↳ An imm. injection should be stab wound

↳ but if it enters tissue Not in cavity  $\Rightarrow$  so "Puncture wound"



Single edge wound  $\Rightarrow$  causes "Fish tailing" wound

- one edge Blunt
- one edge Sharp.



Double edge wound  $\Rightarrow$  causes "spindle shaped wound"

- Both Edges are sharp



Wetabon

Stab wound

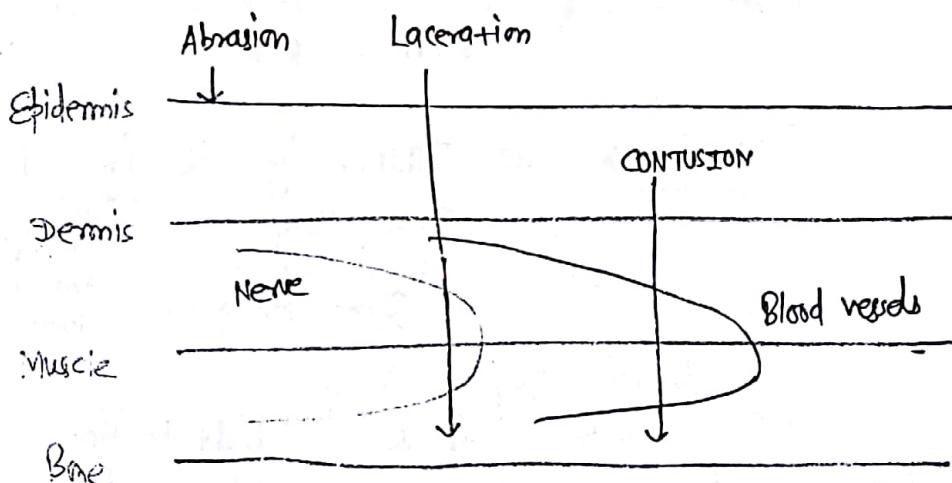
22

Thickness - - - - - → Breadth of the wound

## HARA KIRI

- Japanese Method of Suicide
- Honourable death
- Transverse cut over abdomen
- cause of death  $\Rightarrow$  shock & hemorrhage

INJURIES - By Blunt weapon



~~AI  $\rightarrow$  B~~

Shape of stab wound depends upon:

- (a) Edge of weapon;
- (b) Shape of weapon;
- (c) Width of weapon.

## • ABRASION

↓  
epidermis alone damaged.

- LACERATION

epidermis along  $\vec{c}$  all underlined  
tissues damaged.

- CONTUSION  
• epidermis intact; but only deeper

ABRASION  $\Rightarrow$  Injury damaging the epidermis

Blood vessels  $\rightarrow$  Not damaged  $\rightarrow$  No bleeding

Lymph  $\rightarrow$  Scab

$\downarrow$   
Age of Abrasion  $\rightarrow$  1-3 days  $\rightarrow$  Reddish Brown  
 $\rightarrow$  1 week  $\rightarrow$  Heals

Abrasion anywhere in body Never Causes Hurt; except  $\rightarrow$  corner  
 $\hookrightarrow$  bc it heals by itself.

TYPE OF ABRASION  $\Rightarrow$  1. SCRATCH / LINEAR ABRASION :

2. GRAZE ABRASION : Multiple Linear Mark

$\hookrightarrow$  Resulting in friction burn / Brush burn.

$\downarrow$   
Not getting separate Linear Mark  
seen in RTA

3. PRESSURE ABRASION : Caused by Sustained pressure

Eg  $\Rightarrow$  Hanging.  $\hookrightarrow$  if type of car for 1 min.

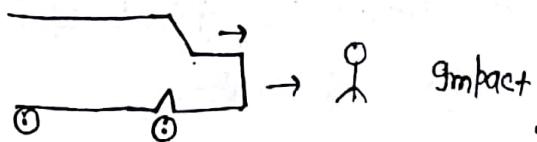
then it cause sustained pressure.

4. IMPACT / IMPRINT ABRASION : Seen in RTA

$\hookrightarrow$  something in Motion;  
component of velocity should be there

Pattern of object is seen  $\Rightarrow$  Key "Pattered Abrasion"

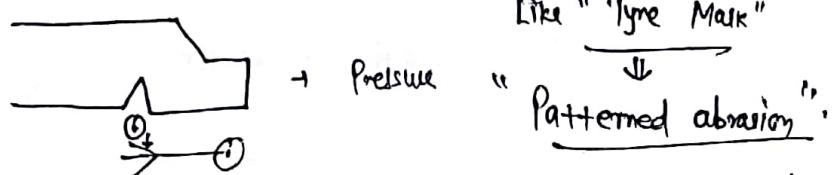
• Speeding car



• If mark is present;

like "Tyre Mark"

• Speeding car breaks &  
stops on leg



$\rightarrow$  Pressure

"Pattered abrasion".

## \*\*\*\* Differential diagnosis (Antemortem Abrasion) :-

- Ant bite mark
- Excreta
- Pressure sore.

Caused by trauma due to Blunt object  
(Fist; Lathi; Stick; Whip  
boot etc)

CONTUSION / BRUISE

- Extravasation of blood in surrounding tissue  $\subset$  Intact epithelium
- ECTOPIC BRUISE  $\Rightarrow$  Seen away from impact.

Racoon's sign



#  $\Rightarrow$  Anterior cranial fossa

contusion  $\Rightarrow$  Periorbital Region

Battle's sign



#  $\Rightarrow$  Middle cranial fossa

contusion  $\Rightarrow$  Mastoid

- Patterned Bruise  $\Rightarrow$  Pattern of the object as Bruise

↳ TRAMLINE Bruise  $\Rightarrow$  Two Pale Line

↳ SIX PENNY Bruise  $\Rightarrow$  contusion Resembling the finger tips of the Mulderen.  
eg  $\Rightarrow$  Throbbing.

↳ Tyre Mark  $\Rightarrow$  can cause Patterned Bruise

Q: Which place contusion is better left than seen?  
Ans  $\Rightarrow$  Scalp.

### Age of Bruise

- 1-2 hrs  $\Rightarrow$  Red  $\Rightarrow$  dlt + Oxy Hb
- 3 hr. - 3 days  $\Rightarrow$  Blue  $\Rightarrow$  dlt + Deoxy Hb
- 4<sup>th</sup> day  $\Rightarrow$  Bluish black  $\Rightarrow$  dlt + Hemosiderin
- 5-6 days  $\Rightarrow$  Greenish  $\Rightarrow$  dlt + Hematoxidin
- 7-12 days  $\Rightarrow$  Yellow  $\Rightarrow$  dlt + bilirubin
- 2 wks  $\Rightarrow$  Normal

$\hookrightarrow$  "Eye" (Subconjunctival Hemorrhage) doesn't show colour change

II  
b'c'g dlt + sufficient O<sub>2</sub>; oxy Hb never converts into deoxy Hb

### LACERATION

Blunt weapon

Margins irregular



Hemorrhage

Tissue Bridges  $\Rightarrow$   $\oplus$

$\hookrightarrow$  Intact fibres & Neaves

### INCISED WOUND

Sharp weapon

Margins Regular



$\ominus$

INCISED LOOKING LACERATED WOUND  $\Rightarrow$  Over Bony Prominence

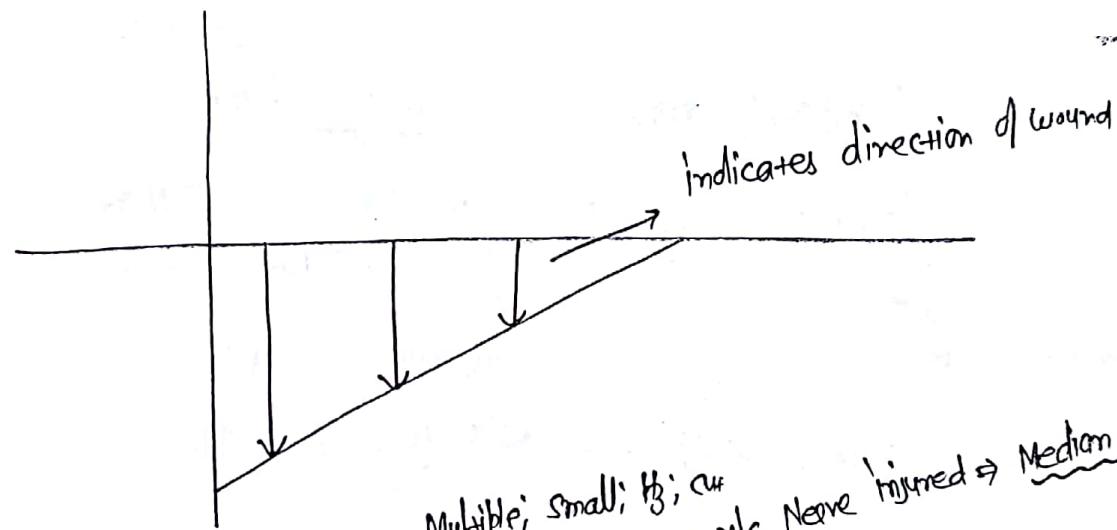
Appeal Incised; but actually Lacerated, (eg: Jaw/tibia/etc..)

LACERATED LOOKING INCISED WOUND  $\Rightarrow$  e.g. Scrotum; Axilla

Appeal Lacerated; but actually Incised

In Lacerated wound  $\Rightarrow$  Swallow tails (Y)

TAILING OF INCISED WOUND  $\Rightarrow$



Hesitation | Tentative cuts  $\Rightarrow$  Multiple; small; fib; cut  $\Rightarrow$  M/C Nerve injured  $\Rightarrow$  Medium N.

Suicide  $\Rightarrow$  Rt. handed  $\rightarrow$  Left sided cuts

Defence wounds  $\Rightarrow$  Indicate Homicide  $\Rightarrow$  opposite to dominant side

Homicidal in Nature  
seen in extensor surface of forearm on Ulnar side  
Avulsion Laceration  $\Rightarrow$  Complete Separation of skin

FLAYING  $\Rightarrow$  giving injury  $\Rightarrow$  Type of Avulsion (Shearing Laceration): In which shearing & grinding force by weight produces.

Skim goes to Type of case  
Type of Avulsion (Shearing Laceration): In which shearing & grinding force by weight produces.

\* Hit & Contusion  $\Rightarrow$  ① Indicates complete penetration;

② helps to know the time since injury;

③ indicates the amount of force applied;

④ direction can't be assessed.

NEET'16  
Q.\* In Penetrating Abdominal trauma d/t stab wound; the M/c injured organ: ① Liver; ② Small Bowel; ③ Diaphragm; ④ Colon

↓  
40%  
↓  
30%  
↓  
20%  
↓  
15%

SKULL #

Frontal & Parietal bone  $\Rightarrow$  6-10 mm  
Occipital bone  $\Rightarrow$  15 mm

Temporal bone - Thinnest bone

Intact scalp  $\Rightarrow$   $400 - \frac{4 \text{ mm}}{600 \text{ psi}} \Rightarrow 65 \text{ N-m}$   
" Pond square ins.

Force

Requires  
#

Clout scalp  $\Rightarrow$  25 psi

Types of skull #  $\Rightarrow$

1. Linear or Fissure # | Polar #  $\Rightarrow$  M/c type of # (skull)

2. Depressed # | Signature #  $\Rightarrow$  2nd M/c type of # (skull)

3. Pondy # | Indented #  $\Rightarrow$  Seen in infants.

↳ Looks like "Ping-pong ball"  $\Rightarrow$  so known as "Ping-pong #".

4. Glutter # | Bullet injuries

5. Committed #  $\Rightarrow$  Spider Web Appearance

6. Diastatic Sutural #  $\Rightarrow$  Common in Young Adults

$\hookrightarrow$  M/c suture to separate  $\Rightarrow$  Sagittal Suture

7. Motorcyclist # / Hinge #  $\Rightarrow$  Involves Base of skull 

8. Ring #  $\Rightarrow$  Seen in Fall from height

$\hookrightarrow$  # along foramen Magnum

9. Bursting #  $\Rightarrow$  Occurs some distance away from site of impact

V.v.g.

Skull # Heals clout visible callus.

### Extradural hemorrhage

- Always traumatic

In Lucid interval; the person can:

- (A) Make a valid will
- (B) can give valid evidence
- (C) is legally responsible for Act done (civil & criminal)

- Middle meningeal artery

- 100 ml of loss is fatal

- Lucid interval can be present

$\hookrightarrow$  Period of Normal b/w two Insane

- Direct hemorrhage seen in EDH

- M/c site  $\Rightarrow$  Parieto-occipital Region

- M/c cause of death  $\Rightarrow$  Respiratory Failure

$\rightarrow$  also seen in  $\Rightarrow$  (A) Insanity; (B) Subacute/ chronic epidural hemorrhage (EDH)

\* Lucid interval is seen in  $\Rightarrow$  EDH > SDH

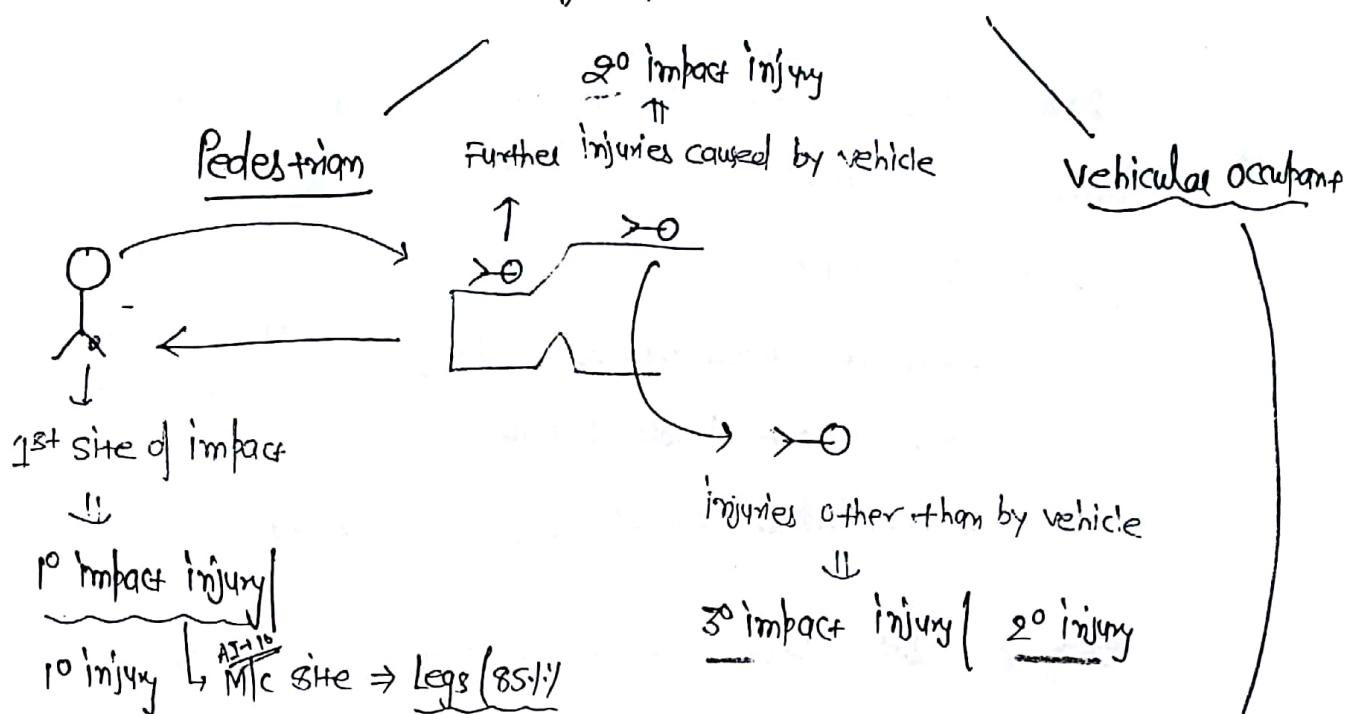
### SUBDURAL HEMORRHAGE

- Traumatic / Spontaneous
- M/c cause - Damage to Bridging vein
  - ↳ Running from cerebral cortex to spinal sinuses
- seen in Boxer; called as "Punch drunk hemorrhage!"
  - ↳ but different from Boxer hemorrhage
  - ↳ Pontine Hemorrhage
- Kernohan's Notch  $\Rightarrow$  U/L grooving of cerebral peduncle
- Duret's Hemorrhage  $\Rightarrow$  Hemorrhage in Mid brain & pons.
- Plaques jaune  $\Rightarrow$  old cortical contusion after head.
- Coup injury  $\Rightarrow$  Injury @ the site of impact.
- counter coup injury  $\Rightarrow$  away from the site of impact
  - ↳ uncommon in occipital region
- Stationary head causes only Coup injury; but Mobile head can cause both

## TRAFFIC ACCIDENT

(26)

- Death even 30 days of Accident is attributed to RTA.



Whiplash injury  $\Rightarrow$  Hyperflexion b/l Hyperextension

Hyperextension b/l Hyperflexion. (M/c)

↳ More dangerous

↳ Stationary car hits by behind Moving car

- No damage to vertebral bodies.

- Spinal cord damaged  $\in$  Anterior Longitudinal Ligament damage.

Windshield glass injury  $\Rightarrow$  "Shower effect Appearance"

↳ Causing Multiple Laceration on face d/l impact of face  $\in$  glass & piece of glass

Seat belt Syndrome  $\Rightarrow$  M/c involved organ  $\Rightarrow$  Mesentery

↳ If not in option

On Driver

$\Rightarrow$  M/cly injured  $\Rightarrow$  Spleen

Co-passenger

$\Rightarrow$  M/cly injured  $\Rightarrow$  Liver

• Tailgaiting  $\Rightarrow$  Decapitation of Motorcyclist after Posterior impact into heavy vehicle.

Q. RTA - 2 bodies found outside vehicle. From which of the following findings we can't differentiate b/w a driver & a co-passenger?

1. ~~Whiplash injuries~~

2. Sparrow beak appearance  $\Rightarrow$  Passenger

3. Linear abrasion of left shoulder  $\Rightarrow$  co-passenger

4. Steering wheel impact injury  $\Rightarrow$  Driver

Q. Enzyme 1st elevated in tissue injury  $\Rightarrow$  Cathepsin

Q. Ladder tear seen in usually  $\Rightarrow$  Driver.

Q. Rolling injuries mainly by  $\Rightarrow$  hit by a vehicle of low chassis.

Q. Diffuse axonal injuries may show  $\Rightarrow$  Retraction bands.

Retrograde Amnesia;

Immediate loss of consciousness

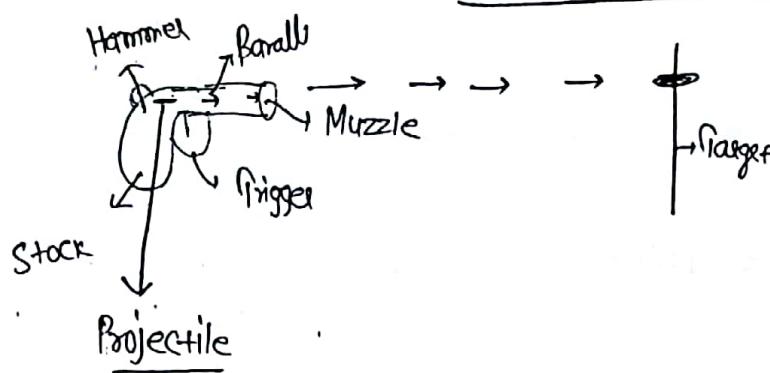
Q. A pedestrian is hit by a car resulting in fracture of tibia. The surgeon says that he is able to determine the direction of impact by the apex of fracture. The apex of fracture of tibia is?

a. Opposite of direction of impact;

~~b.~~ Along the direction of impact;

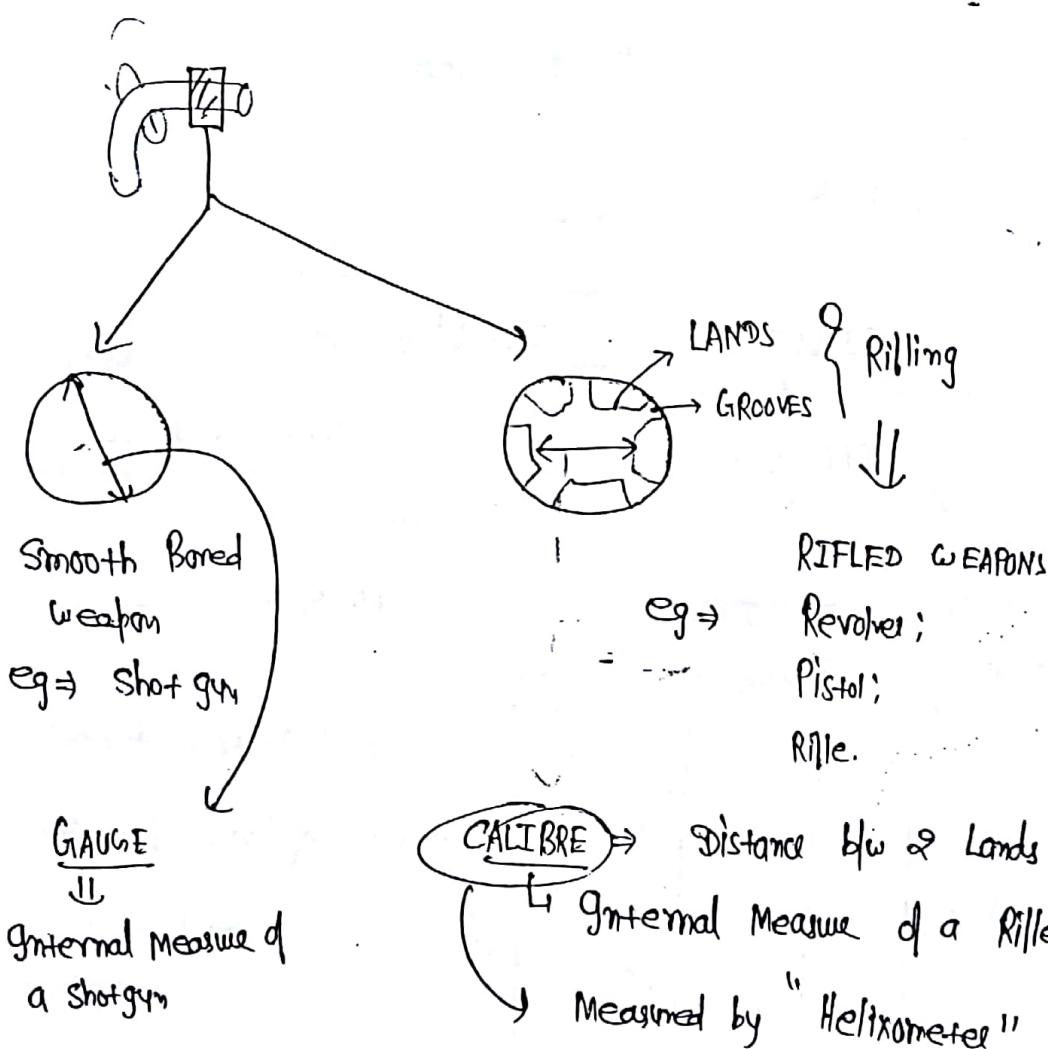
c. Perpendicular to the direction of impact;

d. Not related to direction of impact.

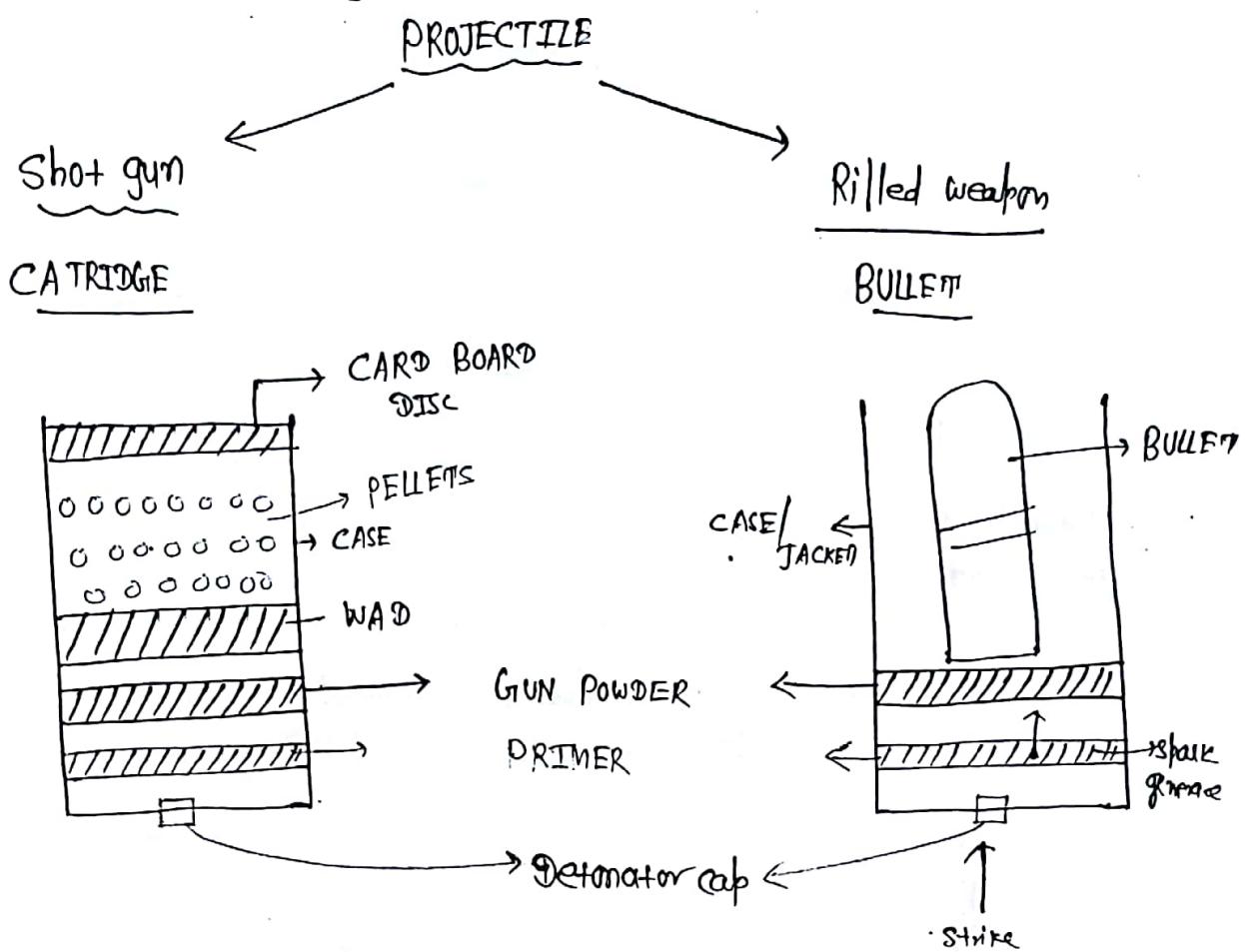


When it is in  
the barrel  
↓

Internal Ballistics      External Ballistics /  
Intermediate Ballistics      Terminal /  
Wound Ballistics



Internal measure of  
a shotgun



effect diff. Crum forced

## FLAME

## SINGEING

SMOKE

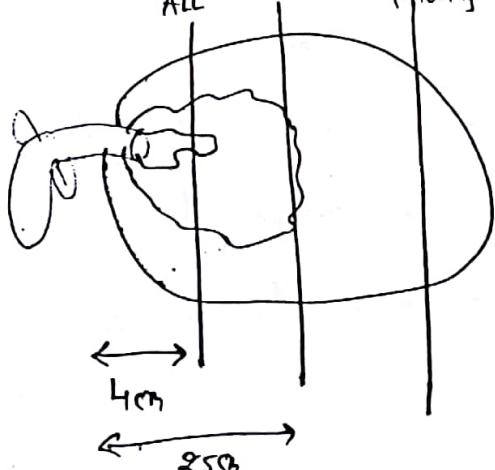
## BLACKENING

## UNBURNED PARTICLES OF GUN POWDER

AL

THOUSAND

No signing only Tatooing



Shot gun

## Rilled weapon

Seen up to 15 cm

8(7)

— 300m

— 60-90 cm

$S|B|\pi$  helps to determine  $\rightarrow$

- ① Dist. of Bullet from Muzzle;
- ② Entry wound (Never seen ②)  
Exit wound

## ENTRY WOUND

(28)

① S/B/T  $\Rightarrow$  +

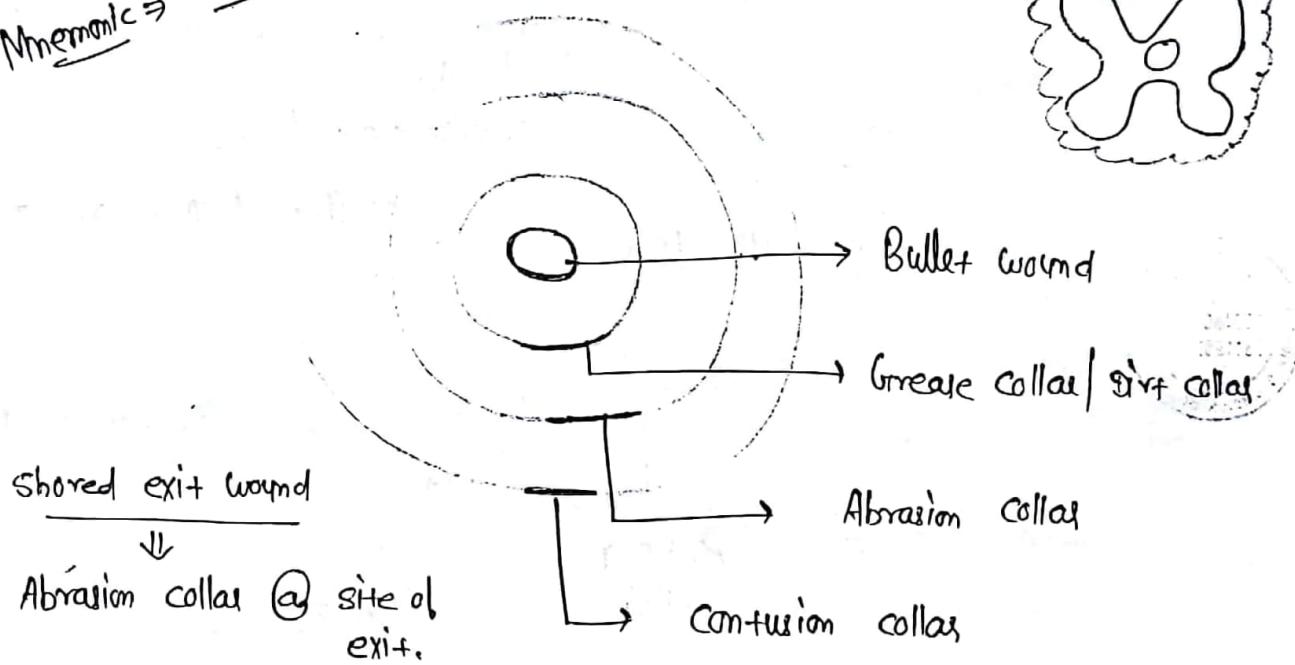
② Cherry Red colour of tissue ( dlt + Carboxy Hb )

→ dlt Gun Powder ( so seen in both Riffled weapon & shotgun )

## Entry wound in RIFLED WEAPON

Mnemonic  $\Rightarrow$  CAGE

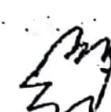
\* Military weapon  $\Rightarrow$   Hole



## Entry wound dlt shotgun

### shape of wound

CONTACT SHOT

$\rightarrow$  cruciate / Stellate shape 

CLOSE SHOT  
( $< 30\text{cm}$ )

$\rightarrow$  oval shape 

NEAR SHOT  
( $30\text{cm} - 1\text{m}$ )

$\rightarrow$  Rat hole shape 

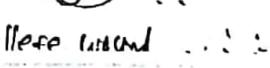
$< 2\text{m}$

$\rightarrow$  wad

$< 4\text{m}$

$\rightarrow$  satellite wound 

$> 4\text{m}$

$\rightarrow$  individual bullet wound 

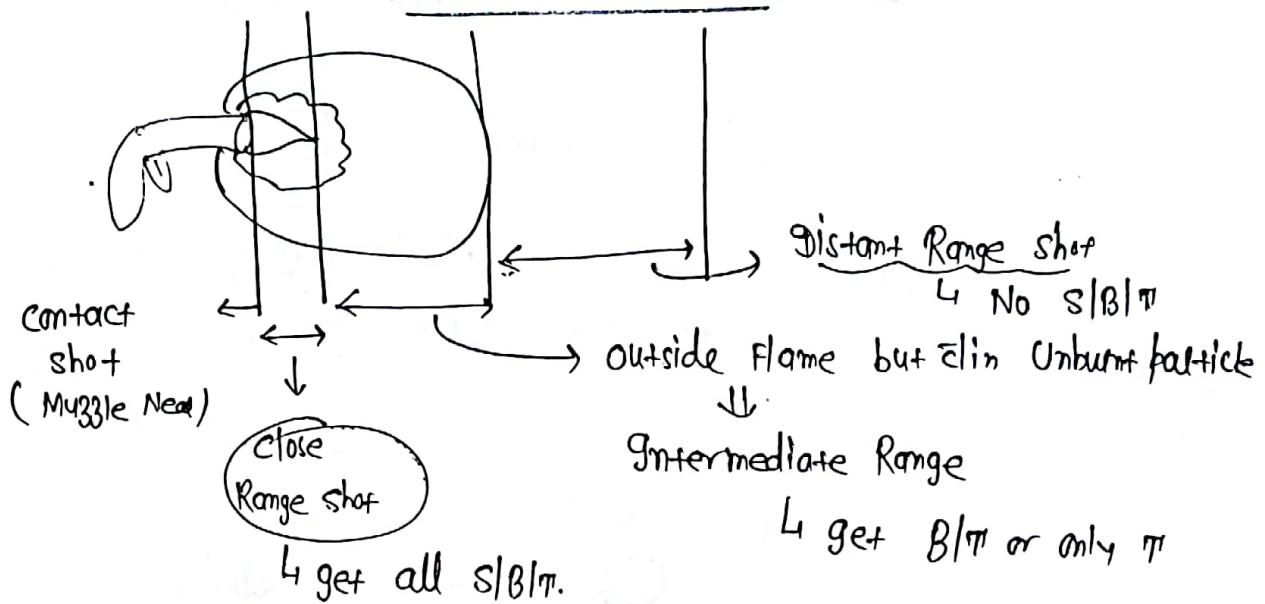
BACK SPATTER  $\Rightarrow$  Seen in contact shot

↳ gases re-enter the muzzle of weapon.

\* S/B/T can also seen in contact shot (Loose contact shot)

↳ gases have space to come out.

### RANGE OF FIREARM



### PRIMER

$\Rightarrow$  Mnemonic  $\Rightarrow$  BAL

Barium  
Nitrate

Antimony  
Sulfide

Lead  
Styphnate

### GUN POWDER

#### BLACK POWDER

$KNO_3 \Rightarrow 75\%$  (Supply  $O_2$  for burning)

$S \Rightarrow 10\%$  (Density compound)

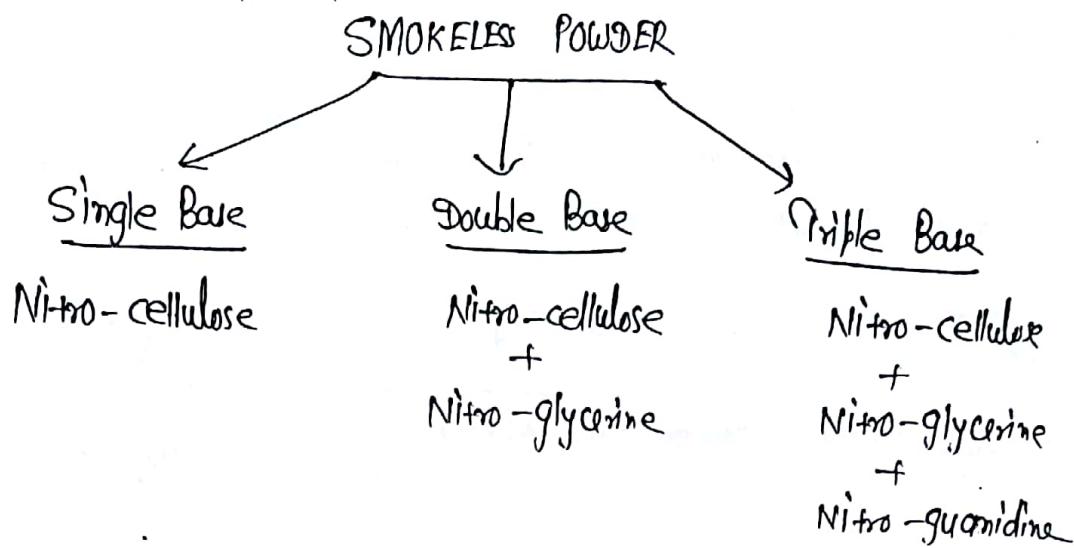
charcoal  $\Rightarrow 15\%$  (Fuel)

- Designated as Fg; FFg; (FFFg) etc

Fine granules

↳ Less No. of Unburnt  
partide; Min<sup>n</sup> fuming; Max<sup>n</sup> gas production

#### SMOKELESS POWDER



- produce 12000-13000 cc/gm
- it doesn't mean No gas/ smoke; Amount of Blackening is less

Test - detect Recently fired FA

① Dermal Nitrate test / Paraffin wax test

↳ Useful for determining the Nitro group base

② Harrison & Gilroy test

↳ (BAL) Primer detection

③ Neutron Activation Analysis

④ Atomic Absorption Spectroscopy (AAS);

⑤ Flameless AAS;

Any Metal detection

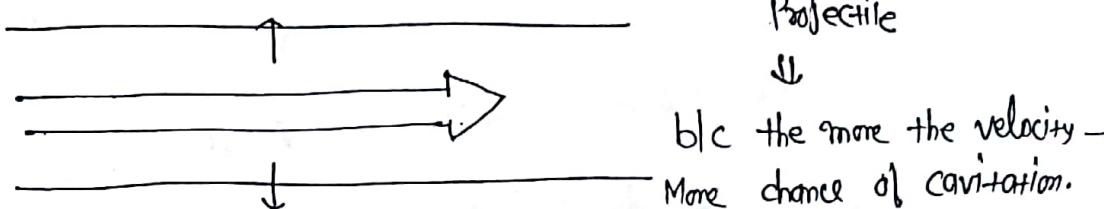
⑥ Scanning Electron Microscopy - Energy Dispersive X-rays  
(Best + 0.1)

↳ Not in option; Move upward from below

## BULLET

→ LEAD (Made of) → May Combine Antimony to make it hard.  
 $K.E. = \frac{1}{2}mv^2$  (less velocity is preferable)

II  
Cavitation → Lateral displacement of tissues by projectile  
Seen in Rifle → Passes into the tissue → HVP → High Velocity Projectile



↓  
b/c the more the velocity →  
More chance of cavitation.

## TYPES OF BULLETS

DUM-DUM BULLET → expands on striking

↳ cut @ Nose  
↳ Banned b/c of Max<sup>m</sup> damage

A hand-drawn diagram of a bullet. On the left, a small sketch shows a bullet with a jagged, irregular front end labeled "Cut Nose". An arrow points from this sketch to a larger, more detailed drawing of the bullet. The larger drawing shows the bullet hitting a surface and expanding into a wide, mushroom-like shape, with the text "expand as Mushroom" written next to it. Below this, the text "Producing Larger diameter wounds of limited Penetration" is written.

SOUVENIER BULLET → prs. in body for long time

↳ caused complication → Pb poisoning  
↳ Known "Retained bullet"

③ Tandem / Piggyback Bullet  $\Rightarrow$  one behind other

(30)

$\hookrightarrow$  Single entry by both

Distance shot May cause two entry wounds.

④ Incendiary Bullet  $\Rightarrow$  contain "Phosphorus"

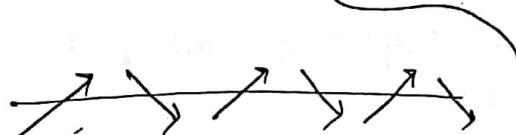
⑤ Explosive Bullet  $\Rightarrow$  contain "Lead azide"

⑥ Richochet / Deflected Bullet  $\Rightarrow$

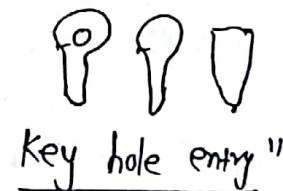
Bullet who stumbles (लड़काना)  
along his axis

Rotate around the axis

"Yawning Bullet"



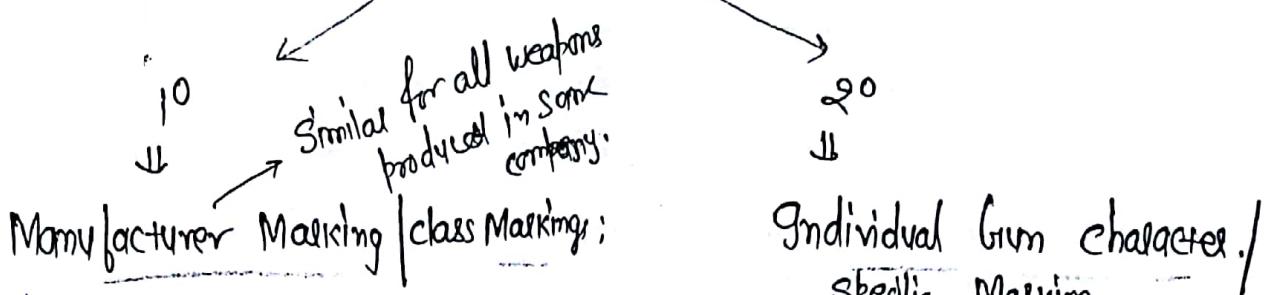
"Tumbling bullet"



Key hole entry

\* By Single bullet we can't tell about weapon correctly.

## MARKING OF BULLETS



**2<sup>o</sup>** Markings are More specific about the weapon from which fire.

- Recovery of Bullet should always done by  $\Rightarrow$  HANDS  
Never  $\in$  blunt object

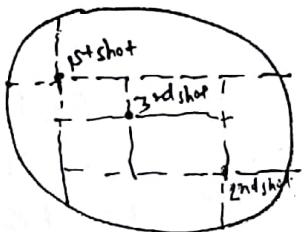
$\rightarrow$  These Markings are Not seen in shotgun as it doesn't have Lugs & grooves

### BULLET INJURIES TO SKULL

1. GUTTER'S #;

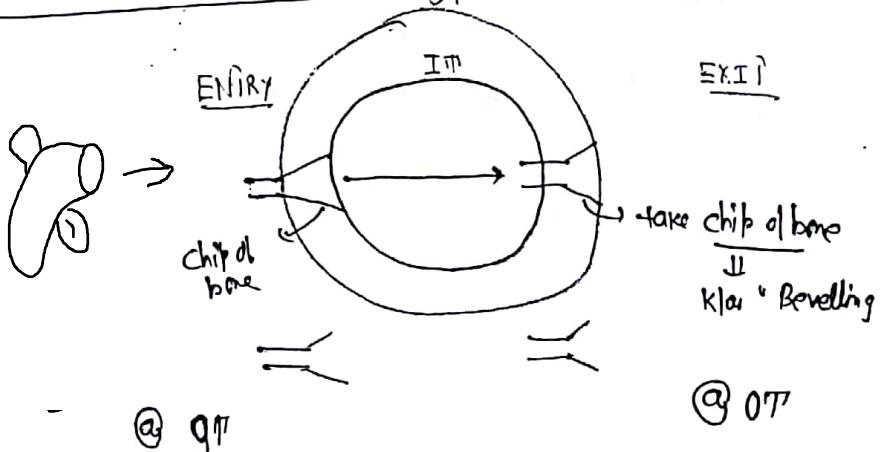
2. PUPPE'S RULE

$\hookrightarrow$  useful to know sequence of shots fired.



$\Rightarrow$  Newly formed # Lines never crossed previously  
# lines.

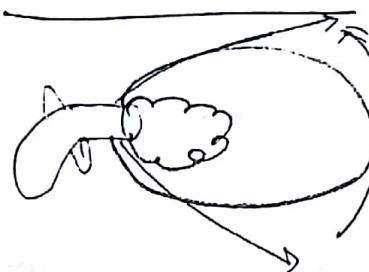
3. BEVELLING OF SKULL  $\Rightarrow$  Chipping of skull.



4. KENNEDY's PHENOMENON  $\Rightarrow$  Surgical Artifacts that prevents distinguishing b/w Entry & Exit wound.

↳ direction of fire is assessed after knowing about Entry & Exit wound.

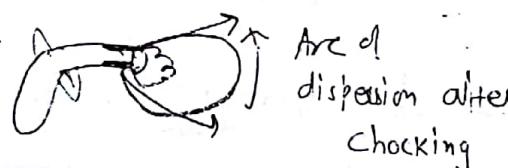
5. CHOKING OF SHOTGUN  $\Rightarrow$  Constriction of Muzzle End



Arc of dispersion

\* Choking Reduce the Dispersion. In Unchoked shotgun there is full dispersion of pellets.

Full choke  $\Rightarrow$  Constriction of 1 mm



Arc of dispersion after choking

Half choke  $\Rightarrow$  Constriction of 0.5 mm

Cylinder bore  $\Rightarrow$  0 mm weapon

$$\text{Spread} = \text{Range} \times \frac{3}{2} \quad (\text{for } \text{cylinder bore weapon})$$

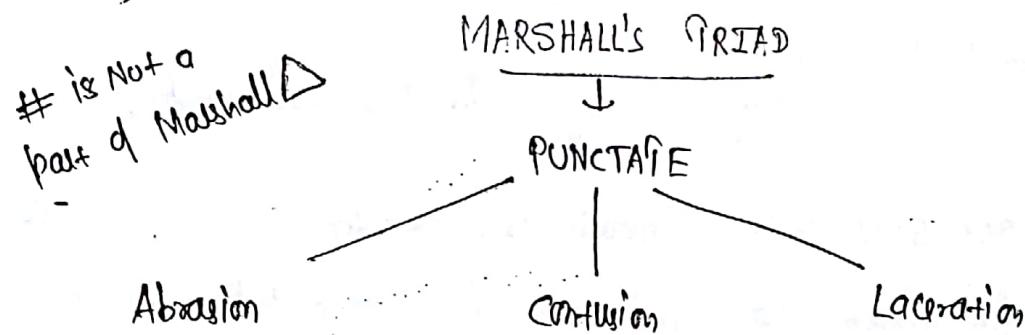
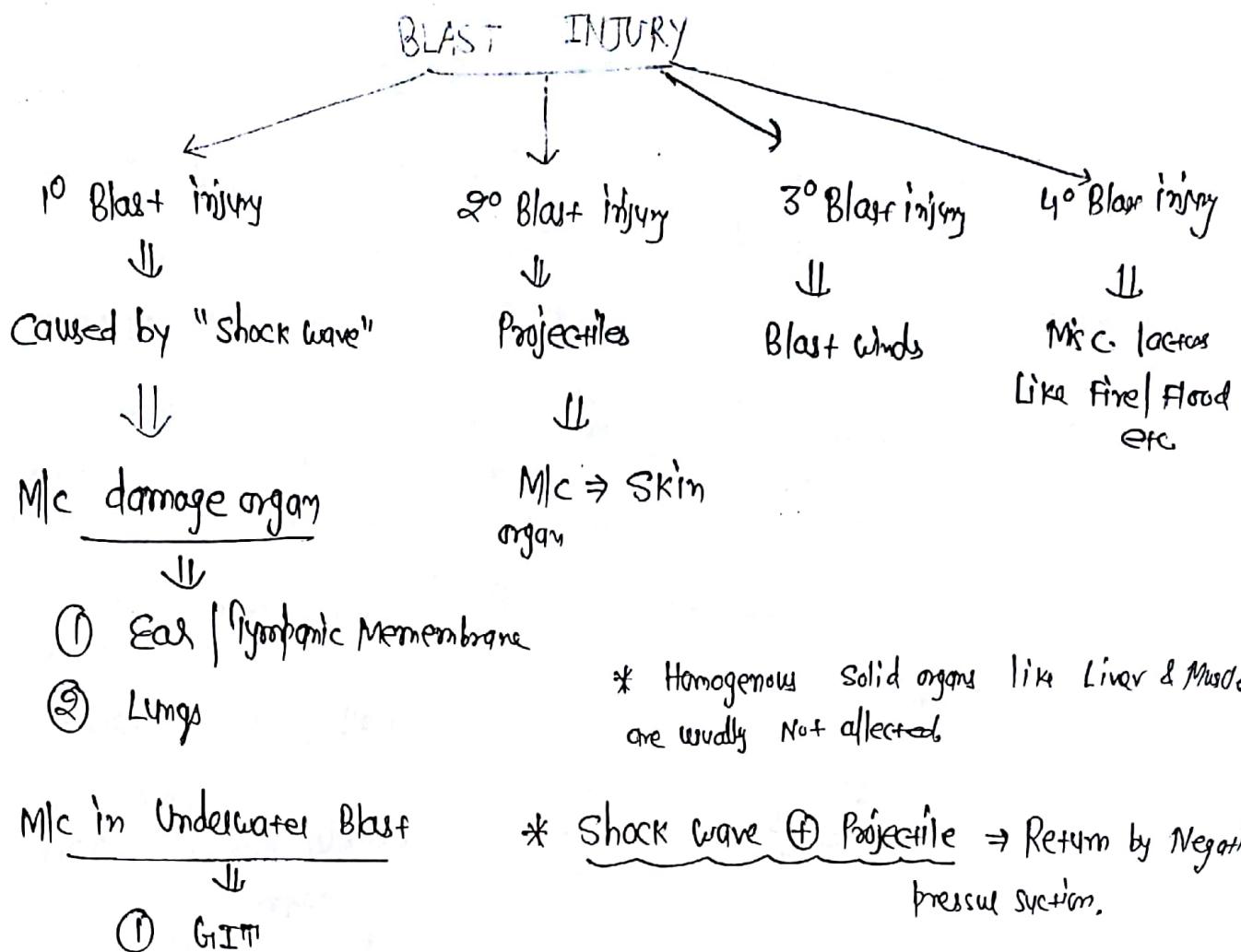
$$\text{Range} \times \frac{3}{3} \quad (\text{for } \text{half choke weapon})$$

$$\text{Range} \times \frac{3}{4} \quad (\text{for } \text{full choke weapon})$$

6. PARADOX GUN  $\Rightarrow$  Smooth Bore weapon  $\cong$  rifling @ the end.

↳ combination gun that can fire both pellets like a shotgun & paradox bullets like a rifle.





MOLOTOV'S COCKTAIL

- Home Made Bomb
- Incendiary Bomb
- Petrol Bomb w/e; Not Kerosene

Q. Stability of the bullet is given by  $\Rightarrow$  Ribbing.

Q. A tyre passes over the leg of a person resulting in Tyre Mark. What is the injury?

- a) Pressure abrasion
- b) Imprint abrasion
- c) ~~Patterned abrasion~~
- d) Bruise

a) Pressure Abrasion

b) Imprint "

c) ~~Patterned Bruise~~

d) Bruise

Q. Ladder tears are usually seen in  $\rightarrow$  ~~a) Driver;~~

- ~~a) Driver;~~
- b) Front Seat + Passenger;
- c) Pedestrian;
- d) Rear seat + Passenger.

Q. Agonal Artifact  $\Rightarrow$  Perimortem Artifact.

Q. Which of the following is Not a Manifestation of shaken baby syndrome?

- ~~a) Burns;~~ b) Retinal hemorrhage; c) Rib #; d) SDD

Q. Not a feature of Post Mortem clot?

- a) Yellow chicken fat appearance; ~~b) Adherence to wall;~~ c) Red currant jelly appearance
- d) Friable

Q. Pyrogallol test is used to differentiate  $\Rightarrow$  Air embolism from Putrefactive gas.

Q. Pink teeth in decomposed bodies is seen in death due to

- a) Asphyxia; b) CO Poisoning; c) CN Poisoning ~~d) None of the above~~

Q. In Water; Putrefactive changes are 1st seen in

- ~~a) Face;~~ b) Chest; c) Upper Limbs; d) Abdomen

Q. After tooth injury; in how much time the socket is completely filled in organic clot?

- a) 1-2 days; ~~b) 1wk;~~ c) 2-3 mth; d) 6 mth

Q. Alliteration cases Refer to

- a) Legitimacy; b) Atavism; c) Substitution child; ~~d) States for Adoption~~

Q. In Advanced decomposition which one of the following can be detected

- a) Valvular lesion of heart;

- b) Thrombus in coronary vessels;

- ~~c) Ligature mark of hanging;~~

- d) Location of brain

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## Thermal Injuries

- COLD**
  - \* Say
  - \* Frost Lip
  - \* Frost Bite → Seen at  $-20^{\circ}\text{C}$
  - \* Hypothermia  $< 35^{\circ}\text{C}$
  - \* Hypothalamus stop functioning  $< 32^{\circ}\text{C}$
  - \*  $< 26^{\circ}\text{C} \Rightarrow$  Death occurs.
- Heat**
  - \* Chilblains / Perniosis
  - \* Trench foot
  - Seen at  $5^{\circ}\text{ to } 8^{\circ}\text{C}$

\* Sequence of event in Frost bite ⇒

- Erythematous patches → Few hours
- Soft blisters → 24-48 hours
- ~~Always~~ Hard & black → 2 weeks
- Dead upto the bone → 1 Month

Thermoregulation  
Stops working

" Vasodilation Peripheral "

Person feels hot & removes cloth; so;

Subsequently hide behind  
Chair, sofa

" PARADOXICAL UNDRESSING "

↓  
Mental confusion

↓  
Found dead over there ⇒

Hide & die syndrome a/w hypothermia

## THERMAL INJURIES

Caused by heat

Heat Syncope also known

"Heat exhaustion / Heat collapse / Heat Prostration".

Localised effect of Heat

Systemic effect of Heat

also known "Fremont's cramp"

Heat cramp | Miner's cramp | Stokes cramp

Heat Syncope

Heat syncope / Sun stroke

Heat stroke / Thermic fever

Body temp. (N)

Caused predominantly by vasodilation

↳ By Sweating & Vasodilation

both are seen in cramp & syncope both.

① Sweating

↓  
Loss of  $H_2O$ , electrolyte

Temperature  $\Rightarrow$  Normal

↓  
Dehydration; hyponatremia

↓  
Heat cramps

Seen when body temp.  $> 41.5^\circ C / 106^\circ F$

② Vasodilation

↓  
Predominant

↓  
Peripheral pallor

↓  
Venuo Return

↓  
Cerebral hypoxia

↓  
Syncope (Heat Syncope)

Hypothalamus stop functioning

Elevated  $\rightarrow$  Rise temp.

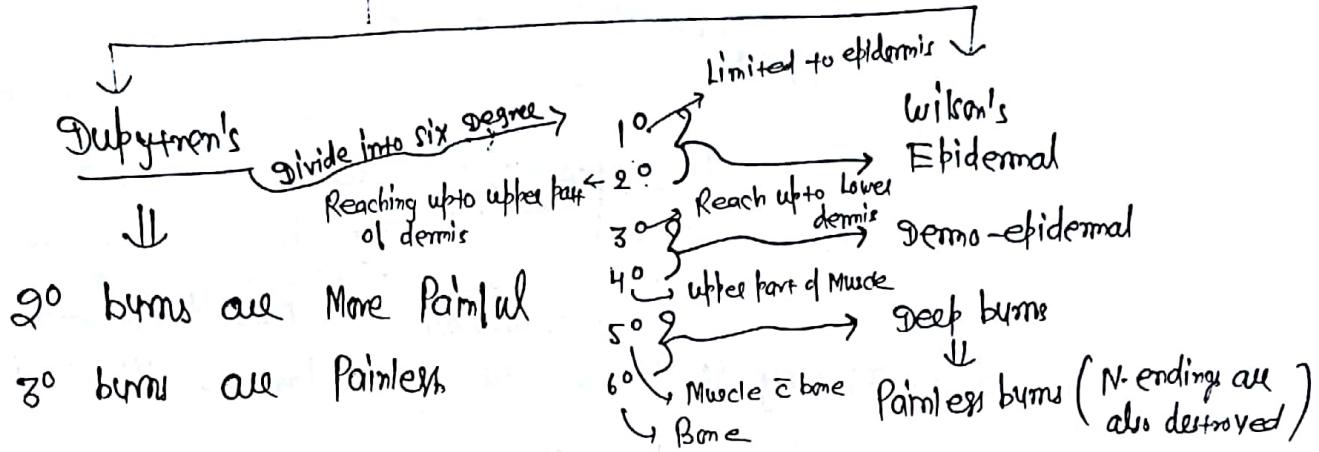
No Sweating

Pin-point pupil seen ( $< 1 \text{ mm}$  size)

also seen in  $\Rightarrow$  Pontine hemorrhage  
Morphine poisoning  
OP Poisoning

## Localised effect of Heat

1. Burns - Min<sup>m</sup> temp.  $\Rightarrow 44^{\circ}\text{C}$  for 6 hr.  
 classification  $45-51^{\circ}\text{C} \rightarrow \text{time} \propto \log \frac{1}{2}$  on  $1^{\circ}\text{C}$  rise  
 $65^{\circ}\text{C} \rightarrow 2 \text{ sec.}$



### Calculation of Burnt area

(A) Lund & Browder chart  $\Rightarrow$  Used in Age  $< 15$  yr.  
 Best Method to calculating Burnt area

$$\text{Genitalia} = 1 + \text{Total body surface area}$$

Face = 7.1.

Neck = 2.1.

Head = 10.1.

Front & Back of Trunk = 13.1. Each

Each Upper Limb = 10.1.

Buttock = 2.5 + each

Lower Limb = 24 + each

Area of Body	In children (Lund & Browder chart)	In Adults (Wallace's formula)
	1-4	5-9 yr
Head & Neck	19	15
Trunk (Front)	16	16
Trunk (Back)	16	16
Upper Limbs	19	19
Lower Limbs	30	34
Genitalia	0	1

(B) Wallace's Rule of Nine  $\Rightarrow$  Used in Age  $> 15$  yr  
 Hemithorax = 1/4 TBSA

(C) Palmer's Rule  $\Rightarrow$  Patchy burns  
 Palm = 1/4 TBSA.

### ANTEMORTEM BURNS

- Presence of soot in trachea
- Measure Level of COHb  $> 5\%$  in Non-Smokers  
 $> 10\%$  in smokers
- Test cyanide (Nylon burn  $\rightarrow$  cyanide)
- Crow feet appearance
- Signs of healing (Yellow coloured contusion)
- Vital Reaction  $\uparrow$  sign of healing

### POST MORTEM BURNS

Heat +  
Hematoma



Honey Comb appearance  
 Light chocolate colour  
 Resembles EDH

• **Heat Rupture**

Resembles Laceration  
(irregular Margin)

- No Bleeding seen
- Blood vessels intact

• **Heat Fracture**

Crosses over Suture line

• Cause of death ↳

M/lc immediately COD ⇒ Neurogenic Shock

CO Poisoning

< 48 hr ⇒ Shock (Hypovolemic Shock)

> 48 hr ⇒ septic (Septicemic shock)

Q. Min<sup>n</sup> v. of Cotto Reg. to give cherry red colour

— 20% —

2. SCALDS ↳ Caused by Moist heat  
temp. > 60°C

3. CHEMICAL BURNS ↳ Brth in → Trickling  
Splashing

Never seen → Singeing of Hair  
Blister

4. ELECTROCUTION  $\Rightarrow$  "Joule burn" seen

Endogenous burn

Normal burn is exogenous burn

central depressed Area



Elevated peripheral Margin.



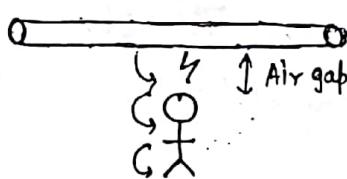
HPE  $\Rightarrow$  Streaming of Nuclei.

Most Resistant part to electric current  $\rightarrow$

Dry Skin  $>>$  Bone  $>>$  Moist skin

follow route of electric current  $\Rightarrow$  Ventricular fibrillation (M|c)  $\Rightarrow$  if path is through heart  
Medullary paralysis  $\Rightarrow$  if path is through Brain

5. FLASH / SPARK BURN  $\Rightarrow$  Arching of current

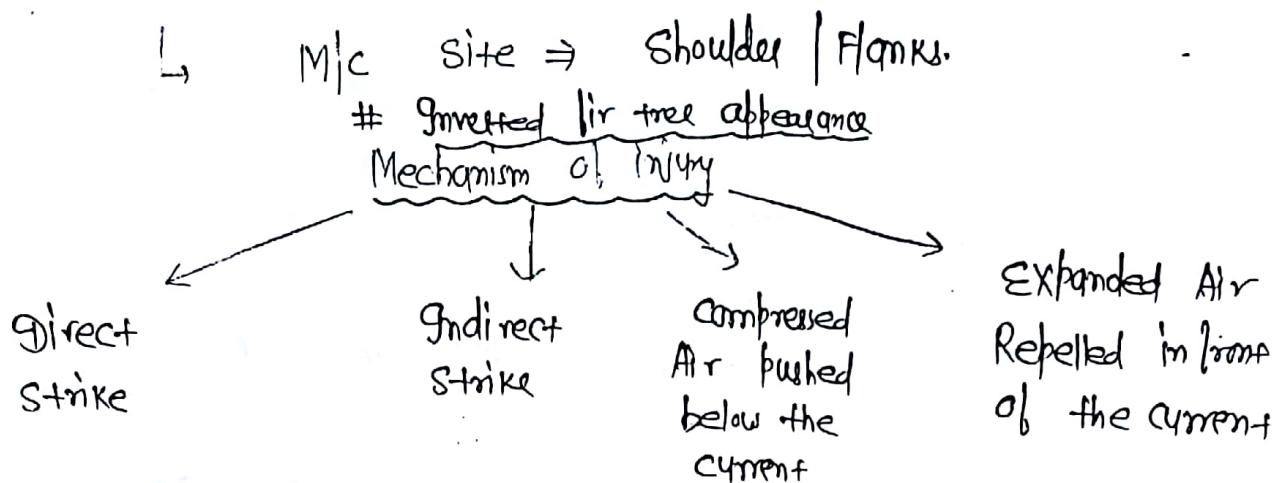


$\Downarrow$  Result in  
crocodile skin appearance

\* Most Dangerous path of electric current  $\Rightarrow$  From Left hand to Right foot.

\* Judicial electrocution caused out  $\Rightarrow$  In U.S. (United States)

5. Lightning  $\Rightarrow$  Filigree | Arborescent burns | Lichtenberg's flowers



$\Rightarrow$  Lightning bolt can cause injury Resembles to Blunt Trauma.

Q. Which of the following is Not suggestive of Inhalational Burn injury?

- a) Yellow sputum;
- b) Singeing of hair;
- c) Facial Burns;
- d) Hoarseness of voice.

## STARVATION

- Feeling of intense hunger lasts for  $\Rightarrow$  30-48 hr
- Gall bladder distended, dit accumulation of bile from Lack of stimulation.
- Food & water stopped  $\rightarrow$  death - 10 days
- Food stopped  $\rightarrow$  death - 60 days.
- Urinary ketones - Time of Intervention
  - ↳ to forcefully feed the person
- \* Hunger pangs  $\Rightarrow$  when hunger contractions start to occur in the stomach;  
they are informally referred to as "hunger pangs".  
- gt usually don't begin until 12 to 24 hours after last ingestion of Food.

## ASPHYXIA

(36)

↳ i.e. Pulselessness

SMOTHERING  $\Rightarrow$  Lips; Gums; Tongue; inner side of Nose May show bruising or Laceration  
External compression of Nose & Mouth

STRANGLING  $\Rightarrow$  Obstruction oforo-Nasopharynx by Any impervious  
object.  
i.e filling piece of cloth in Mouth

CHOKING  $\Rightarrow$  Internal obstruction of the upper respiratory tract

POSTURAL ASPHYXIA  $\Rightarrow$  Wt. of self compresses the chest  
↳ seen in "JACK-KNIFE" Position

TRAUMATIC ASPHYXIA  $\Rightarrow$  Wt. of other compresses the chest  
↳ characteristic finding  $\downarrow$  Mosque ecchymosis (DNB + 15)

BURKING  $\Rightarrow$  Homicidal Smothering & Traumatic asphyxia

\* Smothering Resembles endotracheal intubation injury.  
↳ if Not in option: Throttling tick

HANGING  $\Rightarrow$  Constricting Force  $\Rightarrow$  Wt. of body

Knot  $\rightarrow$  Typical occiput (@ Nape of Neck)

Atypical

Knot  $\rightarrow$  Anywhere else

Judicial hanging  $\Rightarrow$  Left Angle of Mandible

(C<sub>2</sub> - G) #

↳ Hangman's #

Taffeur's #  $\Rightarrow$  C<sub>1</sub> #

Undertaker's #  $\Rightarrow$  C<sub>6</sub> - C<sub>7</sub> #

Hanging also of

Complete

Incomplete / Partial

Some parts of body touches the Ground

constricting force  $\Rightarrow$  weight of the head (5-6 kg).

Most characteristic sign of Hanging



Ligature Mark  $\Rightarrow$   $> 80\%$  above thyroid cartilage

Most characteristic sign of Ante-mortem Hanging



1. Gribbling of Saliva

2. La facies sympathétique



compression of cervical sympathetic chain

Some side

Eyelid open

Pupil dilates

Pressure of

2 kg

Compresses

Fibular vein

CO<sub>2</sub>↑

$\xrightarrow{\text{M/c damage}}$  Venous congestion

5 kg

Compresses

Cervical Artery

$\xrightarrow{\text{Cerebral Anemia}}$

Amussat's sign

15 kg

Compresses

Trachea

$\xrightarrow{\text{Asphyxia (M/c CO<sub>2</sub>↑)}}$

Teal in initia  
of carotid Artery

Compresses

Vertebral artery

## STRANGULATION

(37)

CONSTRICTING FORCE  $\Rightarrow$  other than cut of Body.

Ligature  $\Rightarrow$  Ligature strangulation

Manually  $\Rightarrow$  Manual strangulation / Throttling

Bamboo sticks  $\Rightarrow$  Bandola

Elbow  $\Rightarrow$  Mugging

Judicial strangulation  $\Rightarrow$  Garrotting

"Spanish windlass technique"

↳ Practice in Spain.

	# Hyoid	# Thyroid	# Cricoid
<u>Hanging</u>	15-20%	—	—

<u>Strangulation</u>	30-40%	+	Rare
----------------------	--------	---	------

<u>Throttling</u>	40-50%	+	+
-------------------	--------	---	---

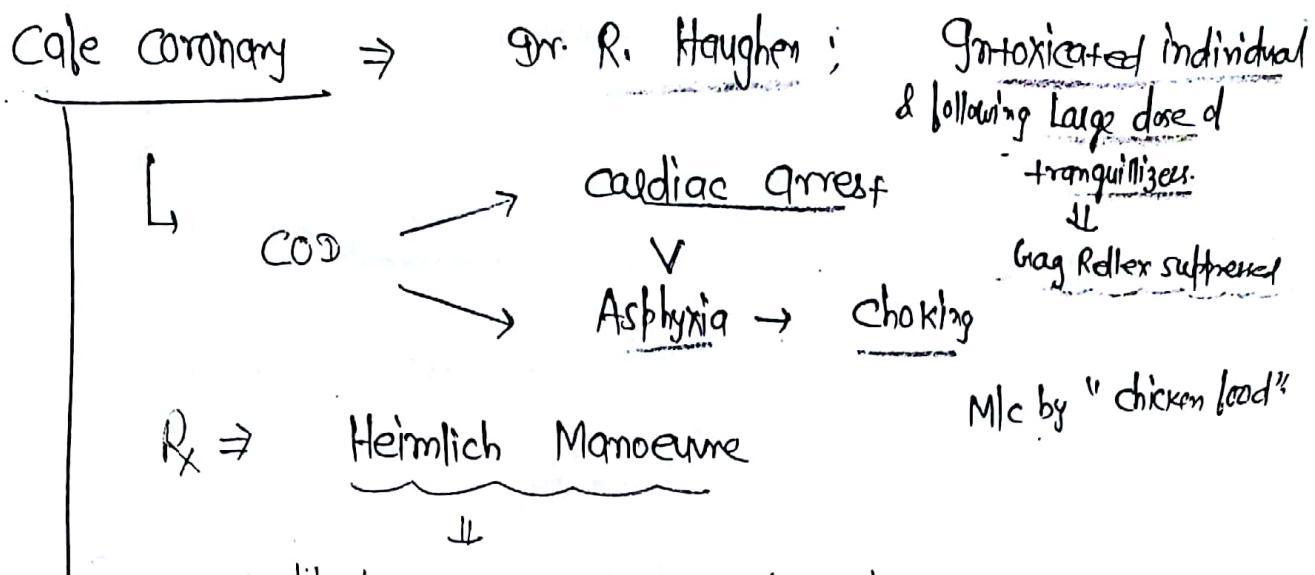
① Adduction / forward compression # of Hyoid

Junction of inner 2/3rd & outer 1/3rd of greater cornu

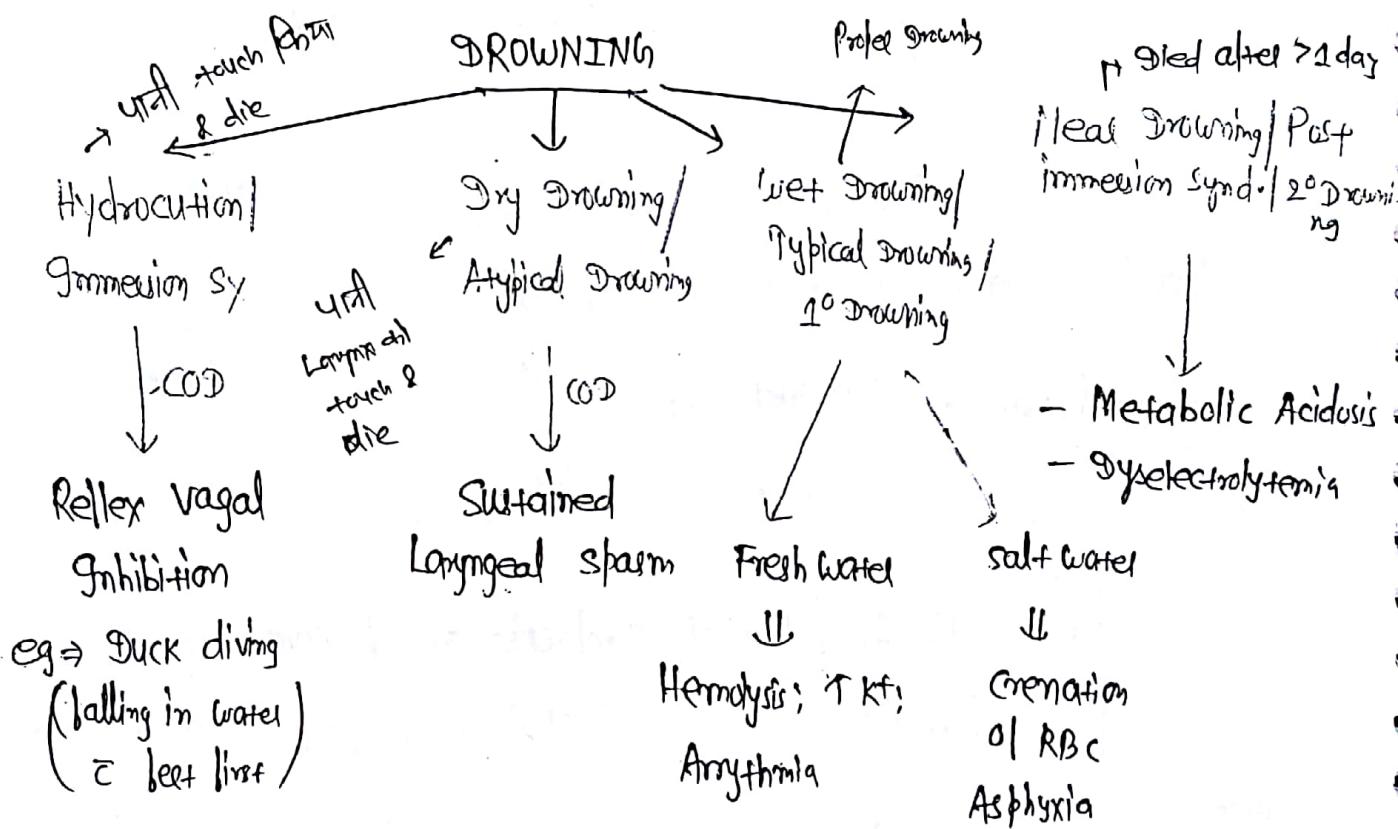
Highly suggested  
Throttling

② # cricoid cartilage

Lynching  $\longrightarrow$  Homicidal Hanging by MoB.



↳ Kla " choking Rescue Procedure"  
if it is external choking by bolus of Food obstructing Larynx.



$\Rightarrow$  Froth  $\Rightarrow$   $\ominus$   $\ominus$   $\oplus$   $\oplus$

↓

b/c person die before water enters in lung

Death  $\Rightarrow$  contain of Respiratory Passage + Aspirated water.  
(Mucus + Air + Sputum)

(38)

Pathology of drowning  $\Rightarrow$

Fresh water drowning  $\Rightarrow$  Hypotonic  $\rightarrow$  cells loose  $H_2O \rightarrow$  Hemolysis  $\downarrow$  +  
Swelling & Bursting

Salt water drowning  $\Rightarrow$  Hypertonic  $\rightarrow$  plasma conc<sup>n</sup>  $\uparrow$   $\rightarrow$  R.B.C. Loses water

$\downarrow$   
Crenation of R.B.C

$\downarrow$   
Asphyxia  $\leftarrow$  can't take  $O_2$

Dangerous?

Fresh water: Dies in 3-4 min

Salt water: Dies in 8-12 min.

PM appearance of drowning  $\Rightarrow$

Grass & weeds  
in hands

Washwoman's  
hands & feet

Cut's Anselma /  
Goose flesh

$\Downarrow$

$\Downarrow$

$\Downarrow$

Cadaveric  
spasm

$\geq 24$  hr (Body in water)

AM/PM

$\Downarrow$

Seen in both

$\frac{1}{2}$  d/f Riger Maris

Seen in AM

AM/PM

PM appearance of lung  $\Rightarrow$  Alive & conscious (in AM drowning)

Found only in wet drowning:

Not in dry drowning

Emphysema acuosum (water logged; heavy voluminous lungs)

Lungs become bulky

Paltau's hemorrhage - sub pleural hemorrhage  
Emphysema

DIATOMS  $\Rightarrow$  Microscopic Algal

↳ Shell Made of Silica  $\Rightarrow$  Frustule

- Diatoms of  $< 60 \mu\text{m}$  enter Pulmonary circulation
- $\oplus$  of diatoms in systemic circulation  $\Rightarrow$  Confirms AM drowning
- Max<sup>m</sup> diatoms are seen in  $\Rightarrow$  BM of Femur but for preservation wed "Sternum"

Best organ to detect diatom  $\Rightarrow$  Kidney

Test  $\Rightarrow$  Acid Digestion test

$\downarrow$   
Conc<sup>m</sup>  $\text{HNO}_3$

- Most characteristic signs of AM drowning  $\Rightarrow$

Grass & Weeds  
In Hand  $\rightarrow$  Emphysema  
acquosum  $\rightarrow$  Palatoglossal Hemorrhage  $\rightarrow$  Diatoms  
in systemic circulation  $\rightarrow$  Fract.

\* Strontium Rise  $\Rightarrow$  suggestive of AM drowning

\* Intimal damage to Cervical Artery  $\Rightarrow$  Hanging is a risk

GETTLER'S TEST : Used to determine Salt/ Fresh water death.

if the difference  $\text{b/w Cl}^-$  b/w two Atria  $\geq 25\%$   $\Rightarrow$   $\oplus$

eg  $\Rightarrow$  1 Unit  $\leftarrow$  RA | LA  $\rightarrow$  10 Unit  $\Rightarrow$  90%  $\Rightarrow$   $\oplus$  \* Normally the chloride content is equal in the R. & L. chambers of heart ( $600 \text{ mg/100 mL}$ ).

\* if  $\text{Cl}^- \uparrow$  in LA  $\Rightarrow$  Salt water drowning;

\* if  $\text{Cl}^- \downarrow$  in LA compared to RA  $\Rightarrow$  Fresh water drowning;

exception  $\Rightarrow$  a) In ASD

b) Decomposed body

c) Brackish water (Isotonic H<sub>2</sub>O)

?  
Gettler's test is Not useful

## IMPOTENCE & STERILITY

(39)

Ability to perform  
Intercourse

Ground for divorce

Ability to beget  
Children

No Ground for divorce

Frigidity  $\Rightarrow$  Female impotence

$\hookrightarrow$  Vaginismus  
vagina is abn.  $\hookleftarrow$  spasm of Adductor of thigh.

Anti-Rape Muscle  $\Rightarrow$  Gracilis (Adductor of thigh).

\* M/c cause of

Impotence  $\Rightarrow$  Vascularogenic

Temporary impotence  $\Rightarrow$  Psychogenic

\* SUO AD HANC - Selective impotence

### CONSENT OF SPOUSE

MTP  $\longrightarrow$  X

sterilization  $\longrightarrow$  X

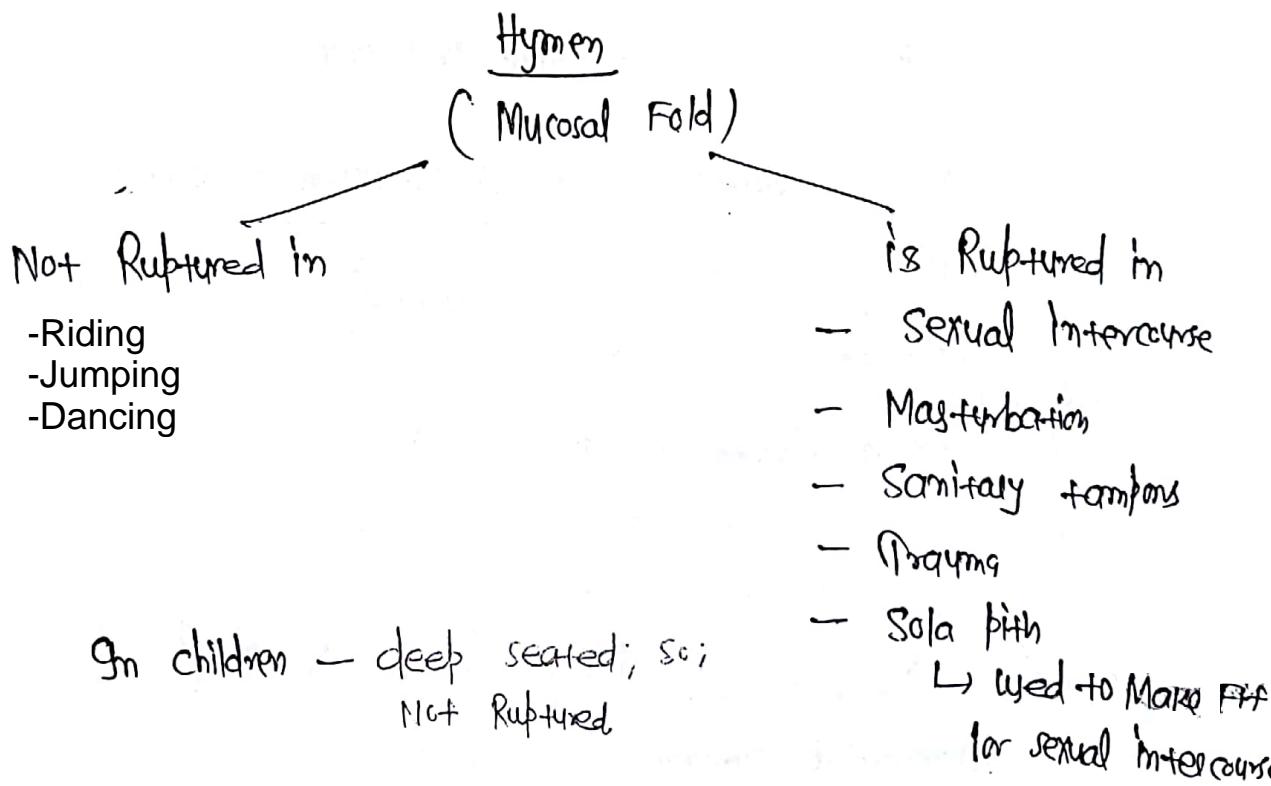
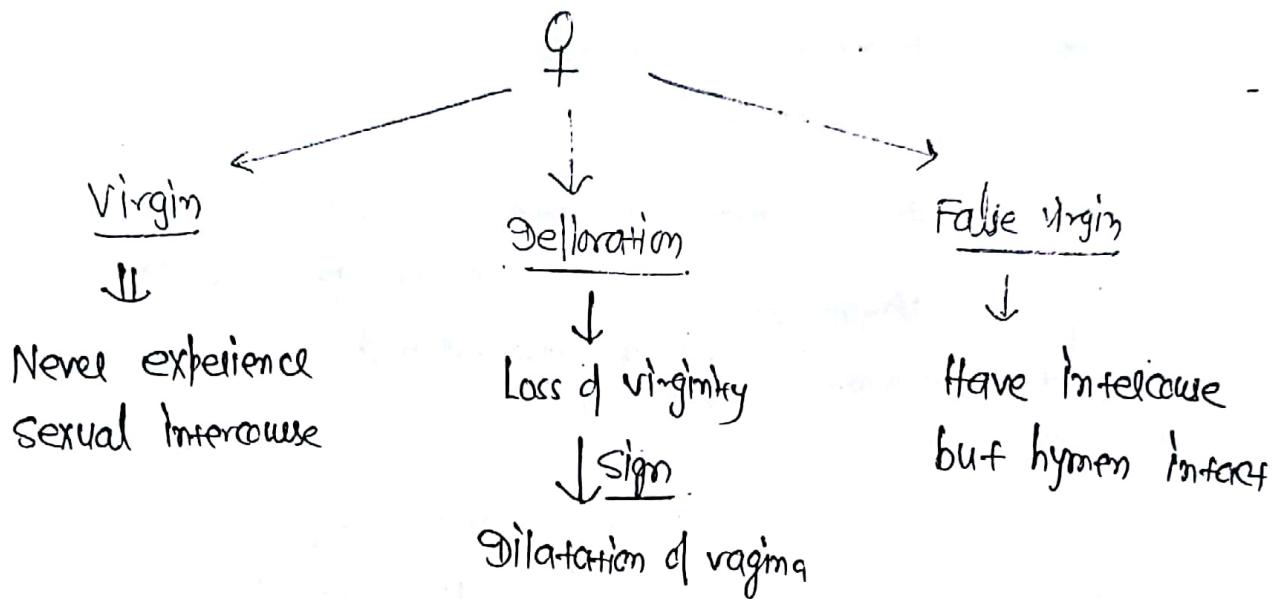
Artificial Insemination  $\longrightarrow$  ✓

### SURROGACY REGULATION BILL, 2016

- No Law Regulating Surrogacy in India  
Commercial surrogacy - Not allowed
- Only the patients who are infertile (after 5 yr of unprotected intercourse)

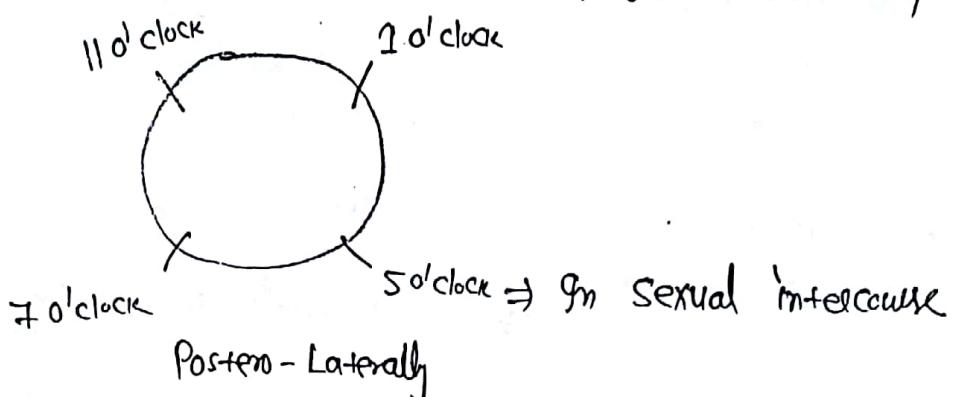
## Surrogate — Close Relative

- should have one child of his own
- only once (excluding failed attempts)



Site of Rupture of Hymen →

Anterolaterally → in Masturbation/Fingering



Glaistel Keene Rod →



Instrument used to inspect hymen.

Type of hymen

→ Crescentic hymen (Mc).

↳ Klaus' semilunar hymen

↳ Fimbriated hymen Resembles torn hymens.

corniculæ Myrtiformes → Remnants of hymen seen after child birth.

Nulliparous uterus

Paras uterus

Cavity → Wall convex from inside

Concave

External os → Circular

Slit like

True virgin

False virgin

Intactness → Hymen intact & inelastic

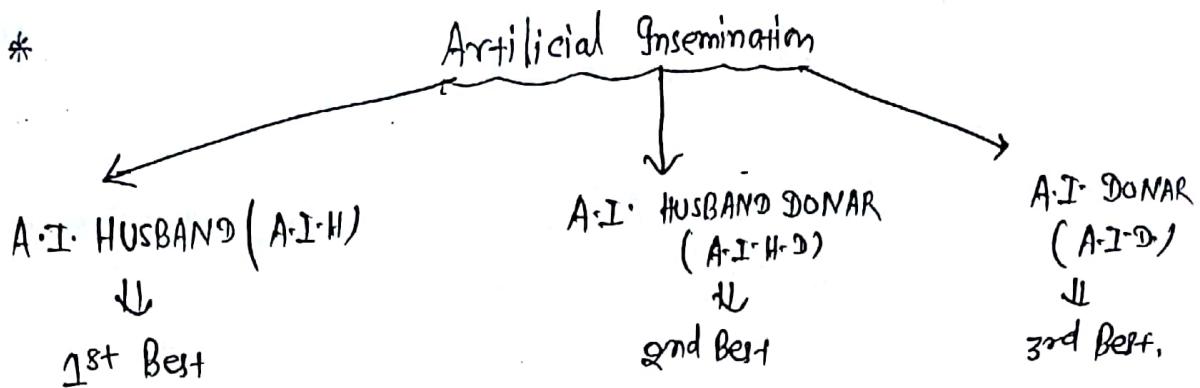
Hymen intact but elastic

Hymen opening → Barely admit tip of little finger

Admits two fingers easily

Edges → Distinct

Undulated.



- \* APTAE VIRIS  $\Rightarrow$  Making a female fit for sexual act/intercourse
- \* NONAPTAE VIRIS  $\Rightarrow$  A female Not fit for sexual intercourse

\* BATTERED BABY SYNDROME

$\rightarrow$  Kjas " Caffey's syndrome"

- Non-accidental injury of childhood

Features - a> Repeatedly come for Rx ;  
 ↳ But come late

b> Inconsistent history in examination;

c> Different age of injury are found.

Most imp. clinical features - a> Oblique # / spiral # Shaken Baby syndrome  
 (B) SDH can be seen Infantile whiplash Sx

(B) String of pearls appearance : seen on chest

(C) Six perry bruises

MENTAL HEALTH ACT, 1987

• Before this; In India there was " Indian Lunacy Act 1912"  
 ↳ Replaced by

Mental health care Act, 2017  $\leftarrow$  Replaced by Mental health act, 1987

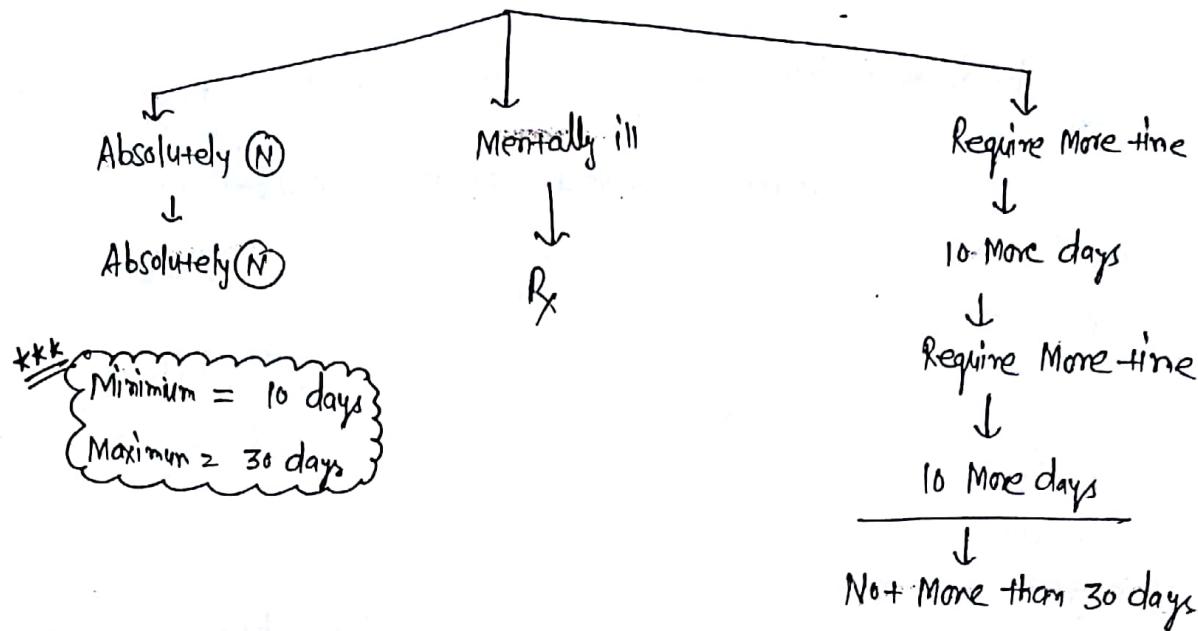
\* "Mentally ill person" is to be addressed (by)  $\xrightarrow{\text{Should produce}} \text{Magistrate places} \rightarrow \text{Reception}$   
 ↳ In front of  
 Admitted to Mental Hospital

\* In these 10 days ; 2 doctors examine thrice

(41)

2 Doctors

3 examination



\* MTP Act, 1971

Last Amended ⇒ 2003

Based on Declaration of OSLO : (Therapeutic Abortion)

- Humanitarian - Rape
- Eugenic ground - Chromosomal Anomalies
- Social ground - Failure of contraception  
Poor socio-economic cond<sup>n</sup> of Parents
- Therapeutic ground - if Mother's Life is Endangered

\* <12 wks : 1 Doctor

12-20 wks : 2 Doctors

>20 wks : Under therapeutic grounds only (irrespective No. of doctors ; irrespective of experience; irrespective of knowledge)

\* Consent of Husband is Not Required;

\* Consent of only woman is Required (if she is over 18 yrs & some)

consent of Parents / guardian is Required if she is below 18 yrs or above 18 yrs but insome

MTP (Amendment) Bill, 2014 (Not Act)

\* Should be increased till <24 wks

\* Not only Allopathic; but also Elite doctors should be allowed  
(RMB / Ayurvedic / Unani)

## THANATOLOGY

— Study of death in all aspects

— Bichat | Bishop  $\Rightarrow$  Trifod of Life Modes of death / Atria, Mortis

- Brain  $\xrightarrow{\text{Stop functioning}}$  Coma
- Heart  $\xrightarrow{\hspace{1cm}}$  Syncope
- Lung  $\xrightarrow{\hspace{1cm}}$  Asphyxia  $\text{X}$

Not Mention in Death certificate

Somatic | clinical death  $\Rightarrow$  Some cells are died; Some are alive

$\downarrow$   $\{1-2 \text{ hrs}\} \rightarrow$  Subprimal period

cellular | molecular death

After death (0.5-1 hr)  $\rightarrow$  Topically instill 1% Atropine in eye

$\Downarrow$

?? Pupil

$\hookrightarrow$  Irregular dilation of Pupil

b/c only live cells are

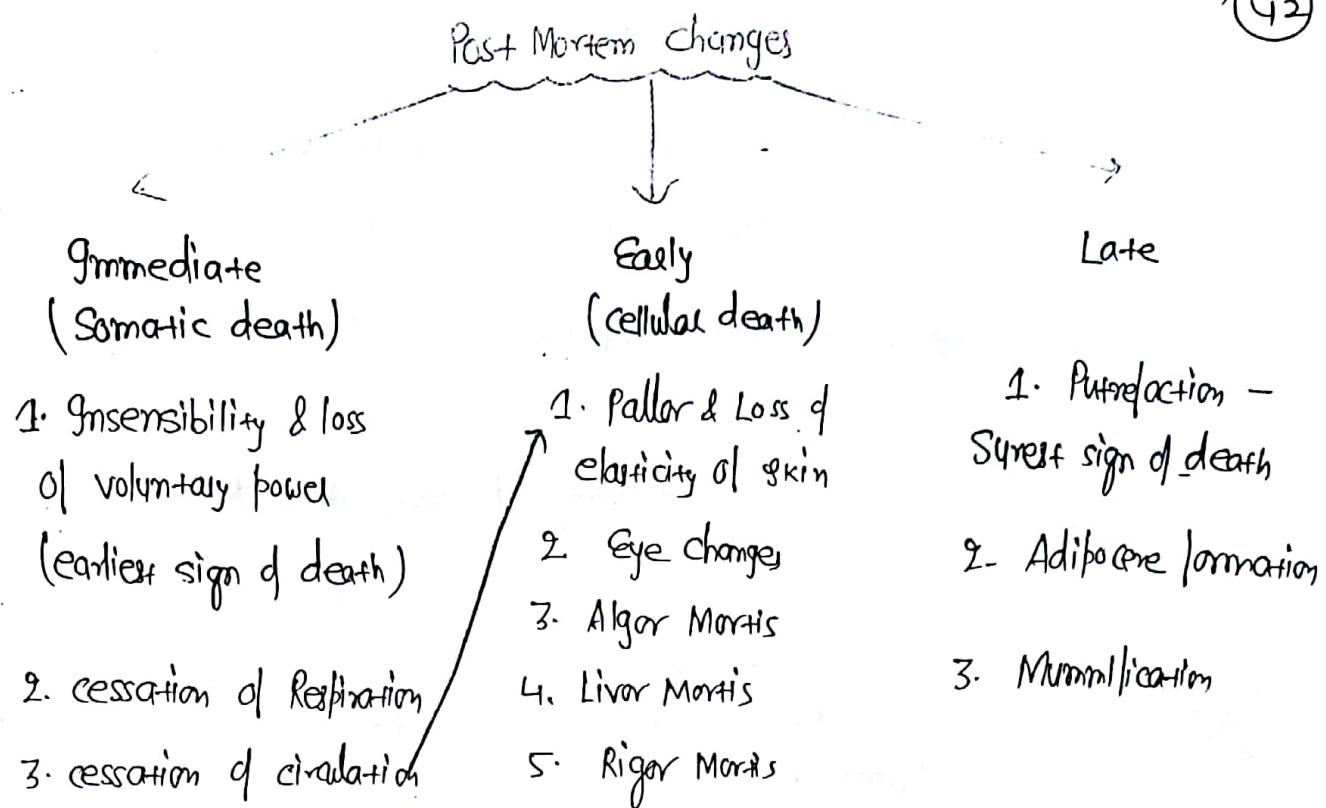
Tsakos Phenomenon

$\rightarrow$  About 1 hr of death

Responding; dead cells are also  $\oplus$

— Kneel jerk (elicit)

$\Downarrow$  contraction of quadriceps.



Eye changes

- ↓ in IOT  $\Rightarrow$  Earliest  
1 hr @ death  
Zero in 2 hrs.
- Rise of Potassium in vitreous humor (MIDEA's FORMULA  
STURNER's equation)
- Cornea  $\Rightarrow$  Hazy in 2 hrs.
- Kevorkian sign / Cattle trucking  $\Rightarrow$  Trucking of blood in blood vessels  
↳ Seen in Minutes ; by Ophthalmoscope.

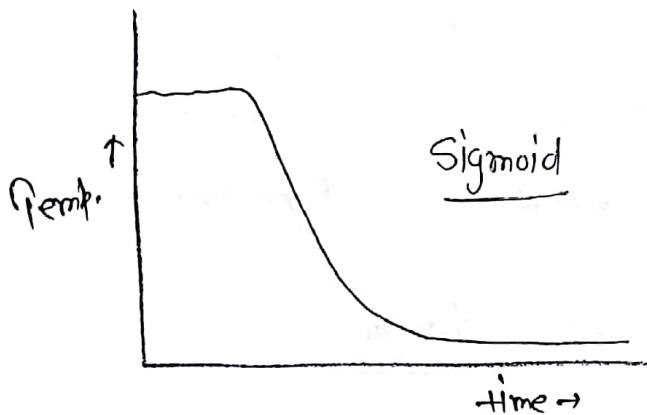


Trucking of blood due to cessation of circulation

Sign seen Maxm upto 2 hrs. (till cornea become hazy).

Tache Noir  $\Rightarrow$  Accumulation of Debris on Sclera  
 $\Rightarrow$  eyelids - open after death  
 $\Rightarrow$  About 3 hrs.  
 Resembles to Pterygium.

ALGOR MORTIS  $\rightarrow$  Cooling of body After death



- temp. doesn't fall till 30-60 min. after death.
- Recording body temp.  $\Rightarrow$  ① Rectum  
 $\Downarrow$   
 $\Downarrow$  but in sodomy
- by "Thermometer"  
 $\Downarrow$   
 $\Downarrow$  inferior surface of Liver
- Length  $\Rightarrow$  25 cm
- ⑥ Synthetic Membrane
- ⑦ Intranasal = cribriform plate

- Rate of Cooling  $\Rightarrow$   $0.5 - 1.5^{\circ}\text{C}/\text{hr}$  OR  $1.5^{\circ}/\text{hr}$   
 $\Downarrow$   
 $\Downarrow$  summer winter

Q\* On 25<sup>th</sup> June 7 am;  $R/T = 31^{\circ}\text{C}$ . Time since death?

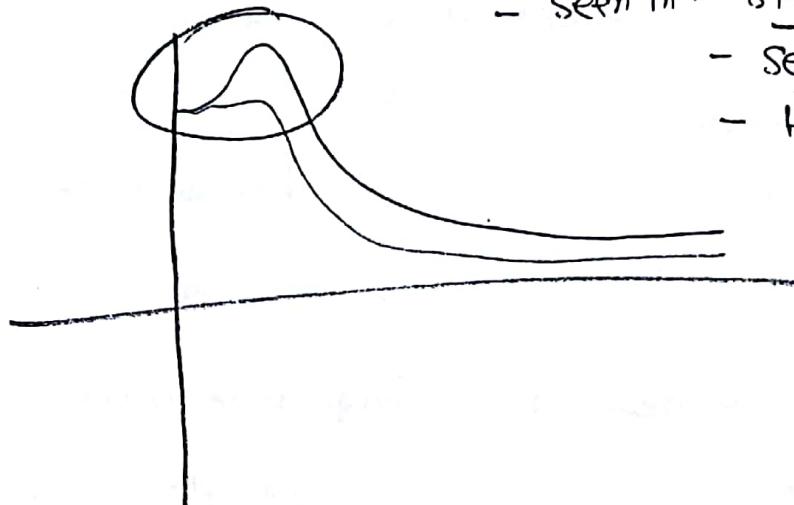
1. 23/6, 7 PM
2. 24/6, 7 AM
3. 24/6, 7 PM
4. 25/6, 7 PM

## Post Mortem caloricity

(43)

Rise of Body temp. 1-2 hr of death.

- Seen in - strychnine poisoning
- Septicemia
- Heat stroke



Hypostasis | Liver Mortis | PM staining | Cadaveric Lividity | Suggillation |  
vibias | Darkening of death.

- Gravitation of blood in dependent parts

- Area of Surface flattening | contact flattening

- Uses - 1. Posture of body

1st seen over Neck - Subjacent position

Glove & stocking position of hypostasis  $\Rightarrow$  Hanging

If body is continuously floating in water  $\Rightarrow$  No hypostasis

2. Time since death

Starts in  
1/2 - 1 hr in  
patches

↓  
2-4 hr  
coalesce  
together

4-6 hr  
well  
developed

> 6 hr  
II  
Fixed

### 3. Cause of death $\Rightarrow$ a) colour changes in hypostasis;

See in forensic Medicine  
simplified  
on 16 page

- b) indices for determining gender;
- c) different declarations;
- d) Torture;
- e) smell in different poisoning



(N) colour after death  $\Rightarrow$  Bluish-purple colour.

#### Poisoning

		<u>colour</u>
i>	CO	Cherry Red
ii>	CN	Bright/ Brick Red
iii>	Nitrates/ K <sup>+</sup> chloride	Reddish Brown
iv>	Aniline	Reddish Brown > Blue
v>	Phosphorus	Dark Brown
vi>	Hydrogen Sulphide (H <sub>2</sub> S)	Bluish green
vii>	KCN	Deep blue
viii>	Opium	Black
ix>	Hypothermia	Pink

#### DIFFERENT DECLARATIONS

① Declaration of Tokyo  $\Rightarrow$  says about "Torture & Medicine"  
 (1975)  $\downarrow$  says A doctor can't use his Medical knowledge for torture.  
 $\downarrow$  It pertains to offences committed to board Aircraft (SNTF)

② Istanbul Protocol  $\Rightarrow$  deals w/ documentation of torture in torture victim.  
 How to document TORTURE.

③ Declaration of Istanbul  $\Rightarrow$  Deals  $\bar{c}$  organ trafficking. (44)

④ Declaration of Oslo  $\Rightarrow$  Deals  $\bar{c}$  Therapeutic Abortion;

⑤ Declaration of Geneva  $\Rightarrow$  Modernization of Hippocratic Oath;

⑥ Declaration of Helsinki  $\Rightarrow$  Deals  $\bar{c}$  Human experimentation & clinical trials;

⑦ Declaration of Lisbon  $\Rightarrow$  Deals  $\bar{c}$  Patient Rights;

⑧ Declaration of Sydney  $\Rightarrow$  Deals  $\bar{c}$  Brain death,

⑨ Declaration of Malta  $\Rightarrow$  Deals  $\bar{c}$  Role of doctor in Hunger strike

- Can't interfere to ones hunger strike
- Forceful feeding is Not allowed,

but if any govt. officer (e.g. Narendra Modi) told to break the strike

$\hookrightarrow$  then by Article 21 we can force people on hunger strike to eat,

⑩ Declaration of Hamburg  $\Rightarrow$  Support for doctors refusing to participate in any other form of cruel; inhuman or degrading treatment

⑪ Declaration of Munich  $\Rightarrow$  Racial; Political discrimination in Medicine.

⑫ Declaration of Venice  $\Rightarrow$  Terminal illness

⑬ Declaration of Seoul  $\Rightarrow$  Deals  $\bar{c}$  Professional Autonomy & clinical independence

⑭ Declaration of Madrid  $\Rightarrow$  Deals  $\bar{c}$  Professional Autonomy & self Regulation.

## INDICES FOR DETERMINING GENDER

### Indices

1. Ischiopubic Index (Washburn's Index)  $\Rightarrow \frac{\text{Female}}{\text{Male}} = \frac{91+0.115}{73-0.94}$

$$\left( \frac{\text{Pubic Length}}{\text{Schiatic Length}} \times 100 \right)$$

2. Pubic Ramus Ratio  $\Rightarrow \frac{\text{Female}}{\text{Male}} = 2:1$  or greater

3. Sternal Index  $\Rightarrow \frac{\text{Female}}{\text{Male}} = 54.3$   $46.2$

$$\left( \frac{\text{Length of Manubrium}}{\text{Length of Body}} \times 100 \right)$$

4. Corpo-basal Index  $\Rightarrow \frac{\text{Female}}{\text{Male}} = 40.5$   $45$

$$\left( \frac{\text{Breadth of 1st + 2nd Sacral Vertebra}}{\text{Breadth of base of Sacrum}} \times 100 \right)$$

5. Sciatic-Notch Index  $\Rightarrow \frac{\text{Female}}{\text{Male}} = 5+6$   $4+5$

$$\left( \frac{\text{Width of Sciatic Notch}}{\text{Depth of Sciatic Notch}} \times 100 \right)$$

6. Sacral Index  $\Rightarrow \frac{\text{Female}}{\text{Male}} = 116$   $112$

$$\left( \frac{\text{Transverse Diameter or Breadth of base of Sacrum}}{\text{Length of Sacrum}} \times 100 \right)$$

## INDICES TO DETERMINE RACE

### NEGROES

7. Crural Index  $\Rightarrow \frac{\text{Female}}{\text{Male}} = 83.3$   $86.2$

$$\left( \frac{\text{Length of Tibia}}{\text{Length of Femur}} \times 100 \right)$$

### EUROPEANS

8. Brachial Index  $\Rightarrow \frac{\text{Female}}{\text{Male}} = 74.5$   $78.5$

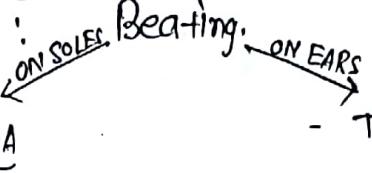
$$\left( \frac{\text{Length of Radius}}{\text{Length of Humerus}} \times 100 \right)$$

9. Intermembral Index  $\Rightarrow$  .70

$$\left( \frac{\text{Length of Humerus} + \text{Radius}}{\text{Length of Femur} + \text{Tibia}} \times 100 \right)$$

NE9RoEs 70 (45)

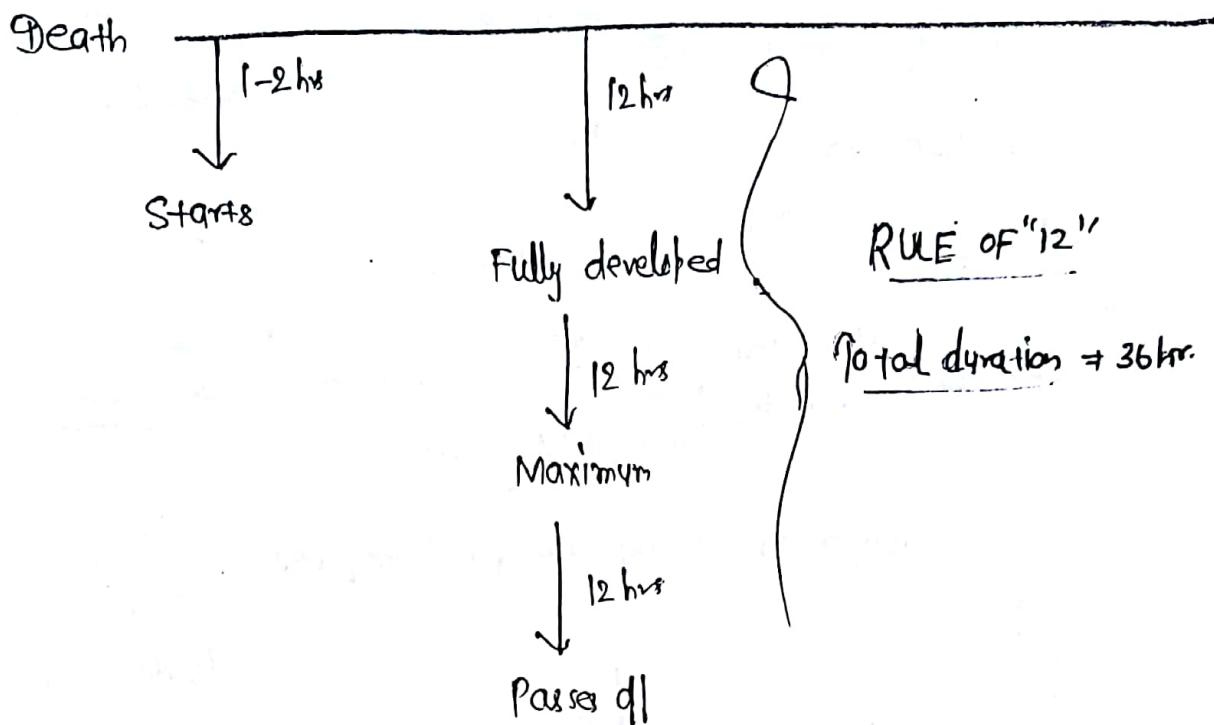
## TORTURE

- \* M/c Form of torture : Beating 
  - FALANGIA
  - TELEFONO
- \* Dry Submarine  $\Rightarrow$  Tying a plastic bag over the head Until Suffocation.
  - $\hookrightarrow$  Can we tell A.M. or P.M. death ? Yes
- \* Wet Submarine (Latina)  $\Rightarrow$  Forced immersion of head in water contaminated  $\approx$  Urine or feces.
- \* Picana  $\Rightarrow$  Electric torture.
- \* LA PARILLA  $\Rightarrow$  Tie a person to electrometallic grill.
- \* PLANTON  $\Rightarrow$  Torture by prolong Standing ;
- \* STRAPPEDO  $\Rightarrow$  Tie hand behind person & suspend  La Bandera
- \* PARROT'S PEACH :-
- \* CATTLE PROD : Electric Shock over genitals,
- \* CHAPUWA :
- \* GHOTNA :
- \* DUNKING : Victim immersed into water, taken out after some time and given chance to confess.
- \* SHAM EXECUTION : अंगरे बंद करके शौध पर आड़ी के सम्मेलने देवा



## Duration of Rigor Mortis

(46)



## Differential diagnosis of Rigor Mortis

Heat ( $> 65^{\circ}\text{C}$ )

↓

coagulation of Muscle protein

↓

Pugilistic attitude/  
Boxing attitude

Cold

↓

Cold stillness

Gas

↓

Gas stillness

Cadaveric spasm

↳ Klaus "catatonic Rigidity"  
OR  
"instantaneous Rigor"

↳ caused due to "Putrefaction"

- $1^{\circ}\text{F}$  Flaccidity Not seen in it.
- Voluntary gp. of Muscles affected
- Antemortem phenomenon

(N) Death  $\rightarrow 1^{\circ}\text{F} \xrightarrow{\text{R.M.}} 2^{\circ}\text{F}$

Cadaveric spasm  $\rightarrow 1^{\circ}\text{F} \xrightarrow{\text{R.M.}} 2^{\circ}\text{F}$

↳  $1^{\circ}\text{F}$  abt. in cadaveric spasm

\* Differentiate b/w Rigor & Cadaveric spasm  $\Rightarrow$

Cadaveric spasm

Cellular death  $\Rightarrow$   $\otimes$

in subnecrotic period

Rigor Mortis

cellular death  $\Rightarrow$   $\textcircled{1}$

Electrical stimulus  $\Rightarrow$   $\textcircled{f\ddot{f}}$

Medico legal important  $\Rightarrow$  Indicates circumstances & Mode of death.

PUTREFACTION

Indicates time since death

\*

M/c organism Responsible for Putrefaction  $\Rightarrow$  cl. welchii

$\downarrow$   
produce "Lecithinase"

Colour changes

Graves

Liquifactive Necrosis

Colour changes

1st Internal sign

Reddish discolouration of Aortic Intima

$\textcircled{H}_2\text{S} + \text{Hb}$   
Produced by Metabolism of substance produced in intestine

Sulph Hb

2nd Internal sign  
Greenish discolouration on inferior sur. of Liver

1st external sign

Greenish discolouration of R+ iliac fossa

• Caecum  $\approx$  12-18hr

$\downarrow$   
Greenish discolouration of walls of Blood vessels  $\Rightarrow$  Kidney MARBLING

seen in 36-48hr after death

## Changes d/t gases

(47)

Bloating

Distension d/t  
gases

Post-Mortem budge

↓  
Fluid blood  
at nostril &  
oral orifice

Liver

↓

Honey combed  
appearance

Skim

↓

② Dermo-epi-  
dermal junction

↓

Result in Blister  $\Rightarrow$  False-  
Ai

NEEED  
\* 3 conditions are Necessary for Putrefaction  $\Rightarrow$

1. warmth ( $10-45^\circ$ )
2. moisture (Humidity)
3. Air

- Slipping of skin resemblance of Blister
- Loosening of skin/hair

$\hookrightarrow$  72 hrs of death

## Liquefactive Necrosis

↓

Seen in 5 to 10 days

\* 1<sup>st</sup> organ to Putrefy  $\Rightarrow$

Larynx & Trachea

↓  
Spleen

↓

Brain

↓

Heart; Kidney

Temp. optimal  
for Putrefaction -  
↓

Last organ to Putrefy  $\Rightarrow$

Bone

↓  
Tendon

↓  
Skin

$21^\circ - 38^\circ C$

♂

←

♀

Prostate

Non-gravid uterus

## Post Mortem Luminescence (Glowing of body after death).

↓ + Photobacterium

↓ + Armillaria

Casper dictum → Fast in Air; then water & then after soil.

- Rate of decomposition

↓

Air: Water: Earth  
1 : 2 : 8

On Absence of Air  
Colour = Greyish white  
OR  
On (NEUTR)

A DIPOCERE

On Absence of moisture  
Colour = Rusty Brown to Black

MUMMIFICATION

- Saponification of Fats

- Desiccation / Drying of tissues

- M/c → Palmitic acid

↳ Produce Glycerine; who

- Require Warm & Moist Atmosphere

<sup>Ex: Salminicaria</sup>  
<sub>soil moist</sub>

- Dry & hot atmosphere

atm. Remove  
Glycerine

- Ammoniacal odour

- Odourless

- Cheesy

- Sweet

- takes about 3 months - 6 months

- takes about 1 yr. to develop

- On India → 3 days

- Chronic As & Antimony Poisoning

↓  
Favours Mummification

- Usefulness

CO<sub>2</sub>

Time since death

Identification (Facial features are preserved only in early stages)

↓  
Useful in

ENTOMOLOGY

⇒ Delayed in Rainy seasons

Study of Insects

Death

↓ Minutes

Eggs

↓ 8-24 hrs

Maggots

↓ 3-6 days

Pupae

↓ 3-6 days

Adult Fly

\* Pink teeth in decomposed bodies is seen in death due to seepage of Hb in dentinal tubules.

~~NEET~~

1st organ to be involved in Mummification ⇒ Skin of exposed body parts like Lips; Nose tips; Hands (Fingers) & Feet (toes)

Q. Which of the following is Not suggestive of Inhalational burn injury?  
 (A) Yellow sputum; (B) Singeing of hair; (C) Facial burns; (D) Hoarseness of voice

Q. The causative electrode of electric injury can be identified by:  
 (A) Acid Rxn;  
 (B) Current Pearl;  
 (C) Bone Pearl;  
 (D) wax dripping

# ROUTINE AUTOPSY

## Incision →

- "I" SHAPED ⇒ (M/C) Start from chin (  )  
goes in Midline upto Pubic symphysis
- "Y" SHAPED ⇒ Start from Mastoid; goes to Mid sternal Notch → Pubic symphysis (  )
- "MODIFIED Y" SHAPED ⇒ Start from Substernal Notch. (  )
- \* In case of Suspected torture the skin incision used ⇒ X" SHAPED.  
From Tip of shoulder → Angle of Lewis → Pubic symphysis

## Techniques to examine Internal organ

Rokitansky

In Situ



Organs cut &  
Left Inside  
body

Gibon

En Bloc



Organs are  
removed in  
Blocks

Virchow

Individual organ



Individual organ  
are dissected

Letuelle's

En Masse



All or everything  
at once from  
tongue till Rectum

## Cavity opened first

Head



Head injury

Poisoning → Head (Smell of Poison)

Astphxia

No COD Mentioned

Abdomen



Inhalicide

Thorax



Air emboli

Neck

Lastly opened

## Viscera preserve in Routine Autopsy

1. Stomach :  $\approx$  all contents;
2. Intestine : 30 cm of proximal intestine;
3. Blood : 30 ml of blood (taken from Femoral vein;  $\approx$  Min 10 ml should be preserved)
4. Liver :  $1/2$  kg of Liver; should be preserved;
5. Kidney :  $1/2$  of each kidney should be preserved;

7. Spleen : Full spleen should be preserved

## Heart Dissection

(50)

- inflow outflow technique

-  $(RA \rightarrow RV \rightarrow LA \rightarrow LV) \Rightarrow$  Sequence of chamber opened

## Spinal cord

Posterior

Ber+

Anterior

M/c

## Poisoning

During Post mortem we preserve viscera; b/c of some poison have specific character

Digoxin  $\Rightarrow$  Heart is preserved

Strychnine  $\Rightarrow$  Brain | spinal cord

Alcohol  $\Rightarrow$  CSF | vitreous | blood | urine | stomach | Liver

Anesthetic volatile agent poisoning  $\Rightarrow$  a) Lungs in Nylon bag

b) Mesenteric fat  $\hookrightarrow$  Non-absorbable

$\hookrightarrow$  also in OPC poisoning

I.m. injection  $\Rightarrow$  Site of injection preserved

Bile | gall bladder  $\Rightarrow$  Morphine | Barbiturates

Cocaine poisoning  $\Rightarrow$  Nasal swab

Best Preservative  $\Rightarrow$  Rectified spirit (90% alcohol)

Not used  
Rectified spirit;  
we NaCl

Phosphorus  
Alcohol  
Phenol  
Paraldehyde  
Acetone

Antibiotic  
lys  
NaP  
100mg | 10ml  
enzyme  
in m. n. coronastrin

\* M/c Preservative  $\Rightarrow$  NaCl

↓  
Not used in

- Corrosive
- Acornite
- Corrosive sublimate

\* Urine = Toluene  $>$  Thymol

Formalin

↓  
Used as preservative  
in HPE.

\* Rotten fruit @ Crime scene  $\Rightarrow$  Na Meta bisulfite

\* Uric acid crystal  $\Rightarrow$  Alcohol

\* Virological examn  $\Rightarrow$  80% glycerol

\* DNA  $\Rightarrow$  Nucleated

Blood for culture

Blood  $\rightarrow$  EDTA vials

↓

Hair  $\rightarrow$  Plucked

SPS

Spleen

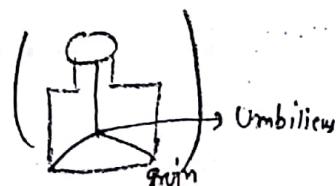
(Sodium polyacrylate  
Sulfonate)

Muscle

### FETAL AUTOPSY

Incision  $\Rightarrow$  M/c  $\Rightarrow$  "I" shaped

Preferred  $\Rightarrow$  Inverted "Y" shaped



Technique for operating fetal skull  $\Rightarrow$

Beneke's technique  $\Rightarrow$  2 Flaps

Baqr's technique  $\Rightarrow$  4 Flaps

### Age of Fetus

Haase's Rule

Up to 5 months

$$\text{CHL} = 25 \text{ cm}$$

$$\text{Age (Mth)} = \sqrt{\text{Length (cm)}}$$

Morrison's Rule

6-10 months

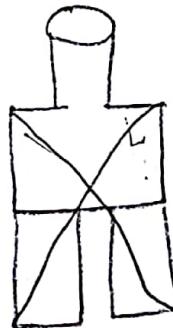
$$\text{Age} = \frac{\text{Length}}{5}$$

$$\text{Crown Rump Length} = \frac{2}{3} \text{ Crown heel Length}$$

\*

X-Shaped Incision  $\rightarrow$  done in Torture

- Kept the body in prone position



Q. Pseudocyesis is usually observed in:

- (A) Childless wife Nearing Menopause;
- (B) Males who are infatuated to a particular woman;
- (C) Unmarried woman in whom contraceptive has failed;
- (D) Young Married woman  $\in$  illicit sexual relation  $\in$  colleague

Q. Initial damage to carotid A. is often death if +:

- (A) Hanging  $\in$  a drop; (B) Ligature strangulation; (C) Manual strangulation;
- (D) Traumatic asphyxia

Q. Following are the characteristics of Ligature Mark of fixed Noose in hanging except that they:

- (A) Are oblique; (B) are continuous; (C) are high up on the Neck;
- (D) Show parchmentization

Q. Yes in what is suggestive of Antemortem drowning

- (A) Scutification; (B) Mg; (C) K; (D) Ca

Problem is with

Still Born

Live Born

1) Position of Diaphragm  $\rightarrow$  3-4<sup>th</sup> Rib  
(That's why we open abdomen 1<sup>st</sup> in Antecide)

6-7<sup>th</sup> Rib

1) Fodere's test / static test  $\rightarrow$  30-40 gm  
(Weight of Lungs)

60-70 gm

Why? b/c of blood

1) Ploucquet's test  $\rightarrow$  1:70  
Ratio of wt of Lungs : wt of body

1:35

1) Breslau's 2<sup>nd</sup> Life test  $\rightarrow$   $\ominus$   
(Air in stomach)  $\ominus$  (Not present)

$\oplus$

(Air is pres.)

1) Werbin's test  $\rightarrow$   $\ominus$   
Air in Middle ear

$\oplus$

Hydrostatic Flotation test  $\ominus$

$\oplus$

⑨ Raygat's test

"air" as CONTROL

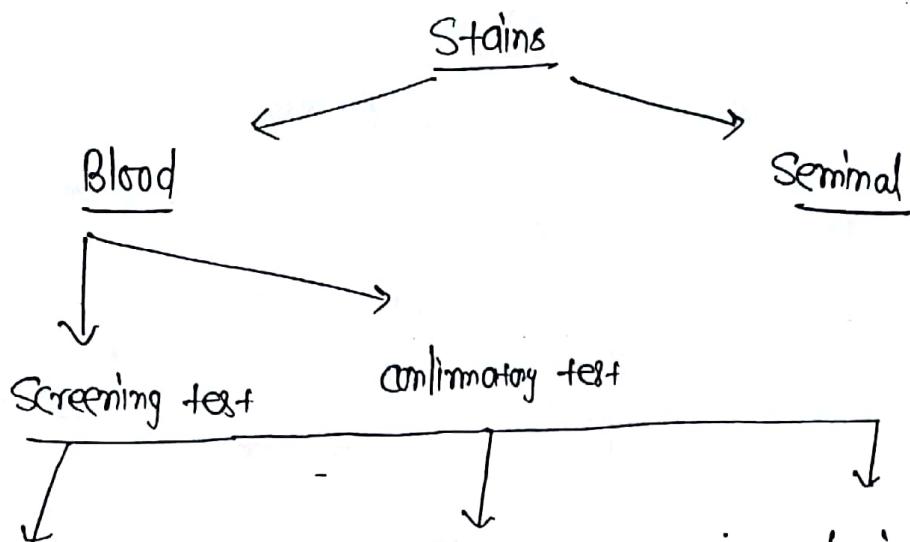
for Residual Air

⑨ False  $\oplus$  Raygat's test

- Artificial ventilation
- Decomposition

⑨ False  $\ominus$  Raygat's test

- Feeble Respiration
- Alveolar Membrane (prevented Air entry into alveoli)
- ARDS
- Atelectasis



Benzidine (Alder's test)

- give deep blue colour
- Most : sensitive
- Not used now a days

↳ b/c of carcinogenic Nature

↳ Bladder cancer

- Old blood stains (used for)

### CONFIRMATORY TEST

Microchemical test

Hematin / Teichman

Brown Rhombic crystal

Glacial Acetic Acid  
+ NaCl  
ie Glacial acetic Acid

Hemochromogen / Takayama

Pink leathery crystals

Spectroscopy

Best & Most sensitive test

## Seminal stain

a) Gm Uv Light  $\Rightarrow$  Blue/ white coloured Fluorescence  $\rightarrow$  dl+ choline in serum

b) Chemical test

- Florence  $\leftarrow$  ↓  
Brown Rhombic crystal of choline  
per iodide
- Baebenio's  $\leftarrow$  ↓  
Needle state Rhombic crystal  
of spermine  
picrate
- Acid Phosphatase  $\leftarrow$  ↓  
Best + test

c) Microscopy (Best)  
- confirmatory test  $\hookrightarrow$  b/c even a single chromatoga can be seen.  
- Christmas tree stain

d) LDH isoenzyme assay  
- gndl Best

e) P30 | PSA -

f) MHS-5

g) CPK - old seminal stains - upto 6 months old

Vagitus Vaginalis  $\Rightarrow$  Cry of Unborn child in Vagina  
 $\hookrightarrow$  Not say child is live birth; b/c child not coming out.

\* Under which section Infanticide Punish  $\Rightarrow$  Sec. 302; Sec. 315

Vagitus Uterinus  $\Rightarrow$  Cry of child in Uterus.

HAIR

- examination of Hair can tell  $\Rightarrow$  i) Identification  $\Rightarrow$  of individual (accused; victim);
- ii) Source of origin  $\Rightarrow$  whether is of Human or Animal

Human Hair

- Fine & thin
- Medullary Index  $< 1/3$
- $$\left( \frac{\text{Width of Medulla}}{\text{Width of cortex}} \right) < 1/3$$
- Evenly distributed pigment

Animal Hair

- Coarse & thick
- Medullary Index  $> 1/2$
- $$\left( \frac{\text{Width of Medulla}}{\text{Width of cortex}} \right) > 1/2$$
- Near the Medulla

iii) Sexual offences;

iv) Crime;

v) Hit & Run case;

vi) Identification of Race by hair;

INDIAN

Straight; black;  
Long & fine

CHINESE & JAPANESE

Straight; black,  
Long & thick

EUROPEANS

Straight;  
Light Brown;  
reddish grey  
& short

NEGROES

Woolly;  
curly;  
black;  
short & thick

### LEGITIMACY

(A) Superfecundation  $\Rightarrow$  Two ova released in same cycle; Fertilized; either during same act of coitus or during the separate acts.

- Possibility of twin having two fathers

(B) Supertetation  $\Rightarrow$  During the continuation of development of fetus; Another ova released in subsequent cycle get fertilized & starts developing as a second fetus.

Can result in  $\Rightarrow$  Twin having two fathers;  
Two children being born together in different stages of development;  
Female may deliver twice in 1-3 months

(C) Supposition child  $\Rightarrow$  Fictional claim of child

(D) Posthumous child  $\Rightarrow$  child born after the death of his biological father

# TOXICOLOGY

Father  $\Rightarrow$  Paracelsus (NEET)

— Drugs & cosmetics Act, 1940  $\xrightarrow{\text{AS 114}}$  Main aim is to control quality, purity & strength of drug).



Drugs & cosmetics Rule : 1945  $\xrightarrow{\text{AS 114}}$  Father of Modern toxicology



## Schedule



Mathieu orfila.

JIPMER  
S

C

Biological agents

E.

Poisonous substance

F

Vaccines & sera

H

Prescription drugs

S

Standard of cosmetics

Best Emetics to vomit the ingested Poisonous



Syb. of Ipecac  $\Rightarrow$  30ml

Best Purgative  $\Rightarrow$  Sorbitol

↳ Loosen stools & res bowel Movements.

— Best Diaphoretic  $\Rightarrow$  Pilocarpine

↳ res sweating & eliminated poison by sweat

## Antidotes

### Physical / Mechanical

1. Bulky food

↳ for Glass Metal

2. Demulcent

↳ Acids

3. Activated charcoal

↳ MQA  $\Rightarrow$  Adsorption

### Chemical

1. KMnO<sub>4</sub>  $\Rightarrow$  Opium;

Phosphorus;

2. MgO  $\Rightarrow$  Acids

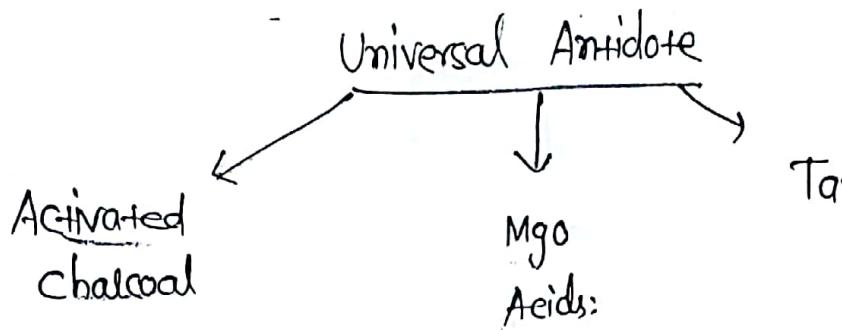
### Physiological

1. Receptor

↳ Shatavari  $\Rightarrow$  Physostigmine

Opium  $\Rightarrow$  Naloxone

Chelating agent



Activated charcoal formed after passing steam over charcoal; by which barriers & Adsorption to

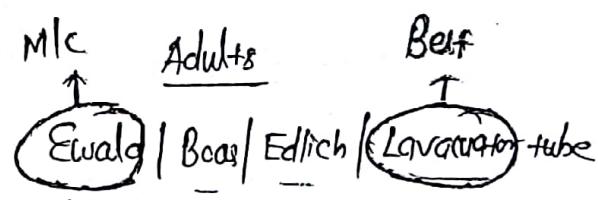
C/I  $\Rightarrow$  Corrosive, Alcohol, Heavy Metals  $\Rightarrow$  except Hg

### Gastric Lavage

#### Tube

children

Ryle's tube



Best Position to do Gastric Lavage  $\Rightarrow$  Left Lateral

Best Fluid to start Gastric Lavage  $\Rightarrow$  Plain water

MIC Fluid used in Gastric Lavage  $\Rightarrow$  Normal saline

KMnO<sub>4</sub> used in 1:5,000 dilution  
in alkaloid Poisoning

Golden Period for doing Gastric Lavage  $\Rightarrow$  < 3 hrs

$\rightarrow$  C/I  $\Rightarrow$  Corrosive  $\Rightarrow$  cause perforation  $\Rightarrow$  except  $\Rightarrow$  phenol / carboxylic acid  
Leathery / thickened  $\leftarrow$

Relative CI  $\Rightarrow$

Kerosene

Convulsant / Anticonvulsant

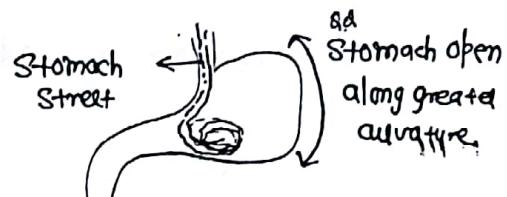
Coma

Hypothermia

Lower esophageal varices

Magenstrasse  $\Rightarrow$  Stomach Street

↳ Path taken by poison in the stomach.



### As Poisoning

$As_2O_3$  — White As; Sankhya

King of Poisons  $\rightarrow$  Fatal dose — 0.1-0.2 gm

Fatal Period  $\rightarrow$  1-2 days

Poison of King  $\rightarrow$  Napoleon dies due to As Poisoning

Arsenophagists  $\Rightarrow$  tolerate As upto — 0.3 gm

### Clinical feature

Fulminant

3-5 gm As consume

Death  $\leq$  in 3 hrs

Acute

Death  $< 24$  hrs

Chronic

Gastricenteric form

Cholera

Sequenced symptom

As

Cholera

Throat pain  
vomiting  
purging

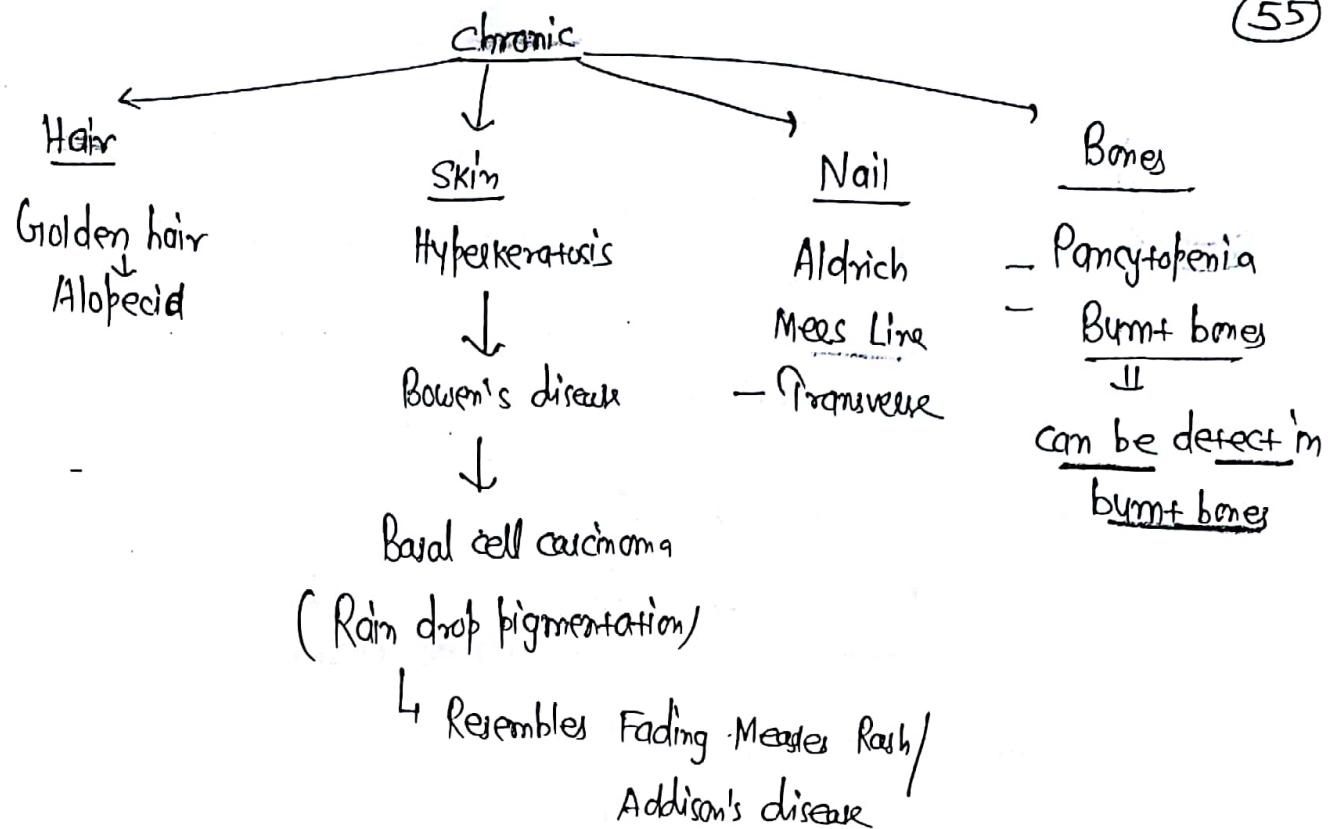
Narcotic form

Convulsion; coma

Liver  $\Rightarrow$  M/c organ to As (Metabolism)

V  
Kidney

Brain has least amount of As.  
L1. A limit, max. 0.001



- also causes Fatty Liver ; Symmetric peripheral sensorimotor Neuropathy ;
- Catarhal sign  $\oplus$  (Resembles Common cold i.e conjunctivitis ; Running Nose & eyes ; coughing etc)
- Black foot disease  $\Rightarrow$  As Poisoning
- Viscera - presence in As Poisoning  $\Rightarrow$  Hair, Skin; Nail; bone + Routine
- Test  $\Rightarrow$  Reinsch  $>$  - Marsh  $>$  Grutzef
- Rx  $\Rightarrow$  Gastric lavage by freshly prepared hydrated Ferric oxide  $\xrightarrow{\text{PGE}_1}$
- TOC  $\Rightarrow$  BAL / Dimer caprol  $\xrightarrow{\text{b/c cause fat embolism}}$
- $\hookrightarrow$  Deep i.m. (Not i.v.)
  - $\hookrightarrow$  C/I in  $\Rightarrow$  Fe, cd; selenium
- PM appearance  $\Rightarrow$  Stomach - Red Velvet ;  
Heart - Subendocardial Hemorrhage  
 $\hookrightarrow$  also in Aluminum phosphide poisoning

## Ideal Homicidal Poison

### Thallium

↳ Resembles "Gullion-Baine Syndrome"

Peripheral Neuropathy  
Alopecia  
Skin Rash

M/c Homicidal Poison  $\Rightarrow$  As

Ideal Suicidal Poison  $\Rightarrow$  CN  $\rightarrow$  Painless death;

M/c Suicidal Poison  $\Rightarrow$  OPC

M/c Method of Suicide  $\Rightarrow$  Hanging

Para-suicide  $\Rightarrow$  M/c  $\Rightarrow$  Drug ingestion  
↳ मरना वाली रिहा स्थिति

## MERCURY

### Organic Mercury

- Methyl Mercury
- ↳ Most Poison
- In Minimata disease

### In-organic Mercury

$HgCl_2$  - 1-4 gm  
↳ Fatal dose

Mercurialism  $\rightarrow$  i.v. mercury inj.

Thrombophlebitis

Granuloma

Pulmonary emboli

C/F  $\Rightarrow$  Hydrogryism  $\rightarrow$  Chronic Use of Mercury (56)  
personality disturbance

- Erethism  $\rightarrow$  Neuro-Psychiatric Manifestation  
stammer; insomnia; mania; mad hatter.
- Gingivostomatitis
- Tremors / Chewing tremors /  $\rightarrow$  Coarse tremor  
Hatter's shake / Glass blowers' shake.
- Mercuria Lentis — Fumes of Hg  $\rightarrow$  Deposits of Am. in capsule of Lens earliest Malt Brown Reflex  
Not affecting visual acuity.

- Strawberry tongue
- Diphtheria like coatis
- Acrodynia / pink ds  $\cong$  (idiosyncratic HSN Rx<sup>n</sup>)
- affects Proximal convoluted tubules

↳ other drugs  $\Rightarrow$  Phenol

CCl<sub>4</sub>

oxalic acid

cadmium

↳ also cause Bone Pain & Muscular Pain

↓

cause "ouch-ouch ds"

• Golden Yellow staining of teeth

• Rx  $\Rightarrow$  N-acetyl penicillamine

Viscera Preservative  $\rightarrow$  R/V + Hair  
Routine viscera

Rx  $\Rightarrow$  G/L  $\Rightarrow$  sodium formaldehyde sulphoxylate

Agent of choice  $\Rightarrow$  BAL

\* EDTA is Cl<sup>-</sup> & Hg block EDTA is also Nephrotoxic.

LEAD  $\Rightarrow$  No heavy Metal is poisonous in Native form  
except  $\Rightarrow$  Lead

- Lead acetate (sugar of Lead)  $\Rightarrow$  Fatal dose  $\Rightarrow$  20 gm
- Lead carbonate  $\Rightarrow$  Fatal dose  $\Rightarrow$  40 gm
- Cl<sup>-</sup>  $\Rightarrow$ 
  - Anemia
  - Eosinophilia
  - Basophilic stippling
- earliest sign  $\Rightarrow$  Facial pallor
- Lead lines in Metaphyseal plate  $\Rightarrow$  Recurrent Gouty Arthritis

(• Chronic poisoning  $\Rightarrow$  Plumbism / saturnism )

- Brownish lines  $\Rightarrow$  Blue Lines @ teeth & gum junction
  - ↳ Seen also in  $\Rightarrow$  Hg; Bi; Ag; Fe; Cu
  - ↳ Kras "clapton lines"
- Cabot's Ring
  - ↳ ie Abdominal Pain
- Colic & constipation seen; very rarely diarrhoea.
  - ↳ dry belly ache
- Encephalopathy  $\Rightarrow$  M/c in children
  - ↳ Mainly d/t Tetraethyl Lead
- Pure Motor Neuropathy  $\Rightarrow$  Least complication of Lead poisoning
- Sterility  $\Rightarrow$  In both sex
- Wrist & foot drop  $\Rightarrow$  Lead Paralysis
  - ↳ d/t peripheral Neuropathy
  - ↳ only in 10% of cases

Diagnosis  $\Rightarrow$  By Measure

(57)

Blood Lead level  $> 10 \text{ mg/dL}$

• Urine test  $\Rightarrow$  Test coproporphyrin (CPU) Levels; of 0.25 mg/L of Lead is diagnostic

Rx  $\Rightarrow$  1. Succimer / DMSA

Given orally; Least Nephrotoxic; useful in  
G6PD deficiency

2.  $\text{Ca}_2 \text{EDTA} + \text{BAL}$

3.  $\text{Ca}_2 \text{EDTA}$

↳ gm - Lead - Encephalopathy; if it is PBC

Least toxic compound of Lead  $\Rightarrow$  Lead sulphide

Most toxic compound of Lead  $\Rightarrow$  Lead Acetate

### Zinc (Metal Fume Fever)

- Resembling Malaria chills; No wheezing
- Self-Limiting influenza-like syndrome

### Mn (Manganese)

- Parkinson's Like disease

### Iodine

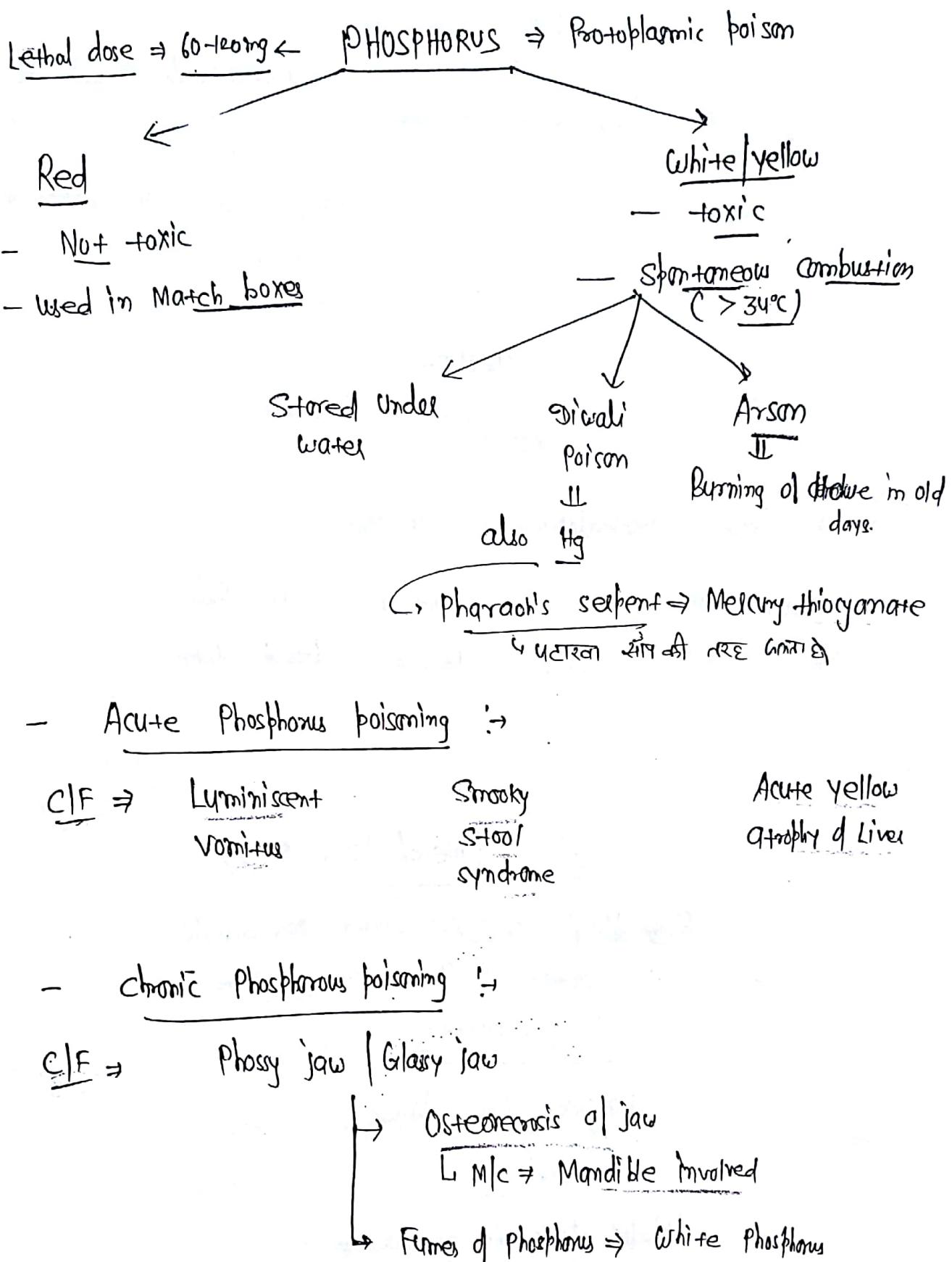
- Painful Parotitis resembling Mumps

Rx  $\Rightarrow$  BAL  $\rightarrow$  Penicillamine Copper  $\Rightarrow$  As a Metal Non-poisonous.

Copper Subacetate  $\Rightarrow$  FD: 15 gm / FP  $\Rightarrow$  1-3 days

Copper sulphate  $\Rightarrow$  FD: 30 gm / Blue-green vomitus; Purple (blue-green) line

## Non-Metallic Poisoning



Rx  $\rightarrow$  No specific Antidote

KMnO<sub>4</sub>,  
vit. K

## Vegetative Implants

## Abrus Precatorius (Ratti)

Seeds - wt  $\Rightarrow$  108 mg  $\hookrightarrow$  K/ $\alpha$ " Glynnchi; crab eye; Rosary pea".

Active principle  $\Rightarrow$  Abrin  $\Rightarrow$  it is Toxalbumin  $\Rightarrow$  Ricin; Protein  
↳ Resembles Viper venom  
↳ Vasculotoxic

Medico-legal importance  $\Rightarrow$  Making "Suis"  
Used to look like viper bite (••)

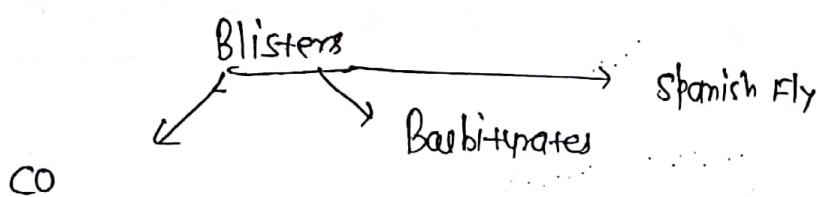
Artificial Bruise  $\Rightarrow$  used to cheat falsely

① Semicarpous *Anacardium* (Mall<sup>ing</sup> Nut) ; ② calotropis; ③ Plumbago; ④ Dithriol  
 Used by washerman to mark clothes. Active principle  $\Rightarrow$  Semecarpol & Bhibitawanol  $\Rightarrow$  API  $\Rightarrow$  Gigantin (NEETI 6)  
 Spanish Fly | Cantharides | Blisters beetle

Active Principle  $\Rightarrow$  cantharidin ( Aphrodisiac)

→ II the sexual desire

- CLE  $\Rightarrow$  Priapism - persistent ~~handed~~ penile erection  
↳ also seen in scorpion sting



## Carbon Monoxide (CO)

Anemic Anoxia (b/c it reacts 200 times more tightly w/ Hb than O<sub>2</sub> & causes anemic type of hypoxia);  $\text{AT} \rightarrow \text{IY}$

CF ⇒ 1st (4+) - Headache

\* 40-50 f. CO - A/C. intoxication (symptom Restlessness)

\* 807.00 - Death d/t Respiratory Arrest.

$\text{D}_x \Rightarrow$  Kunkel's test (Tannic Acid); + Hoppe-Seyler's test  
(10% NaOH)

$\text{R}_x \Rightarrow$  Hyperbaric oxygen.

$\text{PM} \Rightarrow$  Degeneration of Globus Pallidus; Fine froth  $\oplus$  Mouth & Nose;  
examination Bright-cherry red discolouration.  
\* Upper Limit of safety of CO in Air  $\Rightarrow 0.01\%$

## BARBITURATES

- Hypothermia, Coma; Non-Reacting pupil

$\text{R}_x \Rightarrow$  Forced Alkaline diuresis  $\underline{\underline{\text{QG}}}$

- Autoxidation  $\Rightarrow$  Accidental self-poisoning

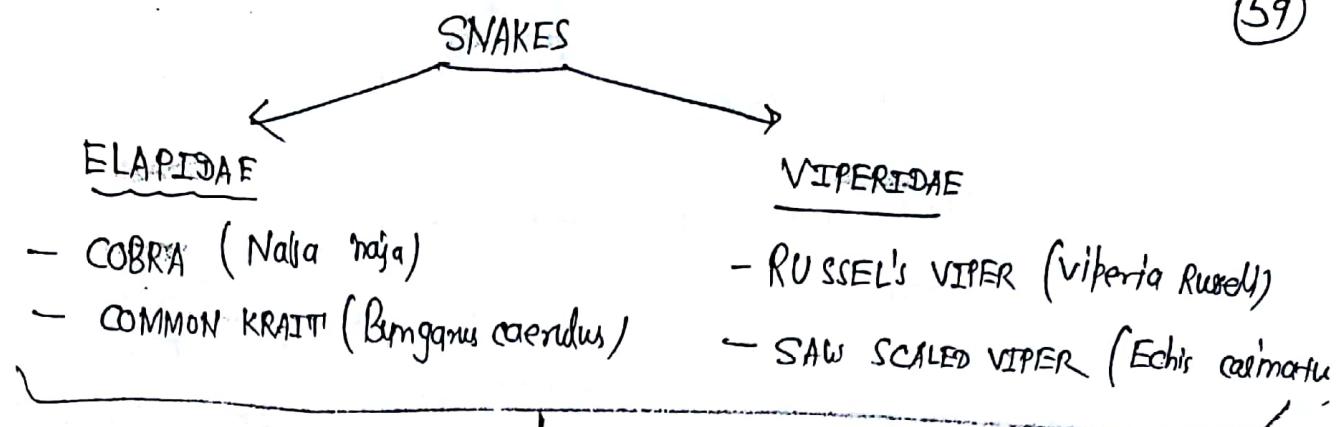
- Golden Urine  $\Rightarrow$  Urine is golden in colour

Liquid gold

$\hookrightarrow$  Urine of Amphetamine Abusers

$\hookrightarrow$  40% Unchanged base in urine

$\frac{11}{\text{after selling it; we can earn Money.}}$



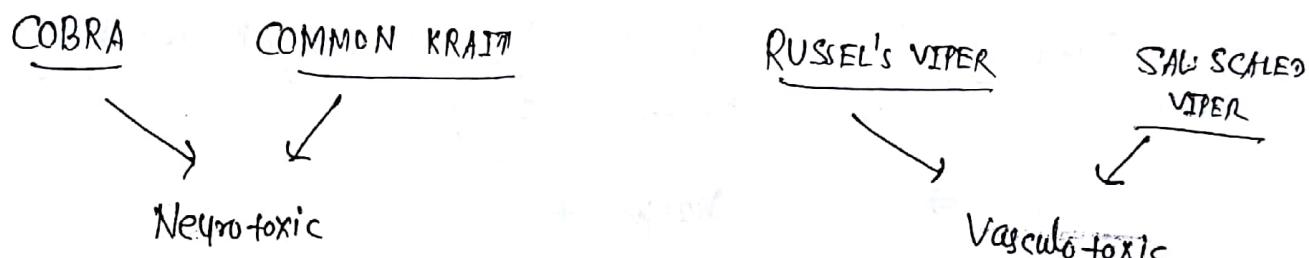
R !

Anti-Snake venom

↳ Not used in "Hyphale hyphale"

bited

↳ "Hump Nose Viper"



Sea snakes (Hydrophididae) → Myotoxic

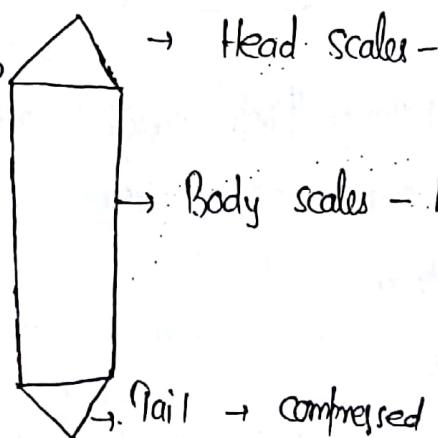
Poisonous Snake

2 fangs & multiple teeth

→ Head scales - Small

Nocturnal habits

→ Body scales - Large



OPIUM  $\Rightarrow$  dried juice obtained by incision of the Unripe capsule (NEET).

- AFIM / MADAK / CHANDU

- Unripe fruit of Papaver Somniferum

- Bhuki

↓

Drug obtain from  
"Poppy Husk"



Longitudinal

↓

Longitudinal incision on  
fruit for opium

- C/F  $\Rightarrow$  Drowsiness; Resp. disorder; Pin point pupil; Coma

- withdraw feature  $\Rightarrow$  Drowsiness; Rhinorrhea; Lachrimation; Goose flesh, Mydriasis (dilated pupil); Insomnia; Yawning; Muscle

- Fatal dose  $\Rightarrow$  Opium - 2 gm      Morphine - 0.2 gm      cramp & body pain; Rise in BP.

- Dx  $\Rightarrow$  Marqui's test

- Rx  $\Rightarrow$  G/L -  $KMnO_4$  - 1:500

↳ Doc  $\Rightarrow$  Naloxone (i.v.) 1/6 oral Naltrexone

↳ for Maintenance therapy.

- Rx of withdrawal  $\Rightarrow$  Methadone (Doc)

HEROIN (M/c abwed opioid).

SMACK; JUNK; SOPE; BROWN SUGAR

- Diacetyl Morphine

- Designer drugs

- Shooting galaxy  $\Rightarrow$  Authorised place where to administrate the drug

i.v.  $\Rightarrow$  Mainlined; shot

- HOT SHOT  $\Rightarrow$  HEROIN + STRYCHNINE
- Chasing of the dragon

Rx  $\rightarrow$  clonidine;  
Butine morphine;  
Pentazocine.

$\xrightarrow{\text{A/P}} \text{Levohyoscymine; Hyosine (scopolamine) \& Atropine.}$

### STUPORFVING AGENTS

Datura  $\Rightarrow$  earliest symptom  
 $\xrightarrow{\text{Bitter taste in the Mouth.}}$

- Roadside Poison
- Datura  $\Rightarrow$  Thorn Apple  
Solanum
- Fatal dose  $\Rightarrow$  100 seeds
- Resembles  $\cong$  chilli seeds
- Human's hand

• Embryo of Datura  $\Rightarrow$  curved outwards  
(2)

• Embryo of chilli  $\Rightarrow$  curved inwards  
(6)

• Cf  $\Rightarrow$  Dilated Pupil  $\Rightarrow$  Diplopia

Dry Hot Skin  $\Rightarrow$  Hyperthermia

Delirium  $\Rightarrow$  Muttering

Pill Rolling Movement

Carphologia

Rx  $\Rightarrow$  Phos tigmine

Cocaine

• COKE, Snow; Cardillac; white lady

Snorting

Cannabis

Smoke  
 $\downarrow$

CRACK

$\hookrightarrow$  Max size of cocaine  
clt smoke

• Half-Lived cocaine  $\Rightarrow$  1 hr.

• cocaine + Heroin  $\Rightarrow$  speed ball

• Cf  $\Rightarrow$  Black tongue & teeth

Perforated Nasal septum

Excited delirium

Hallucination (Visual  $>$  tactile)  
 $\downarrow$

Magnan's symptoms / cocaine bugs

• Formication  $\Rightarrow$  Any Hallucination who involve insects

$\hookrightarrow$  alie septis

(A) Ergot poisoning  $\Rightarrow$  St. Anthony Fingers

$\downarrow$   
As porcine

(B) ~~Anterior tibial~~  $\Rightarrow$  Anterior tibial Resembling sciatica

$\downarrow$   
Anal Nitsche

## CANNABIS / MARIJUANA / INDIAN HEMP

Active Principle  $\Rightarrow$   $\Delta^9$  - Tetra hydro cannabinol

Smell  $\Rightarrow$  Burnt Rose Smell

Marijuana cigarette / Reefs / weed / joint  $\Rightarrow$  1-6 hrs

Preparation from cannabis Active Principle

Bhang  $\Rightarrow$  Dried leaves  $\Rightarrow$  15%

Majoon  $\Rightarrow$  Sweet (Bhang)

Granja  $\Rightarrow$  Flowers (Female)  $\Rightarrow$  25%

Chas  $\Rightarrow$  Resin (stem)  $\Rightarrow$  40%

Hashish

C/F  $\Rightarrow$  i) Run Amok  $\Rightarrow$  Impulse to kill

Person is Responsible for crime

b/c insight  $\oplus$

ii) Amotivational Syndrome  $\Rightarrow$  Apathy; Loss of interest; Reduced drive.

\* Least toxic : Bhang : Flashback phenomenon :  $\Rightarrow$  Person experience the feeling of cannabis we don't actually wing it.

\* Most toxic : Chas : Fatal dose : 2 gm.

## HALLUCINOGENS

1. LSD  $\Rightarrow$  Purple heart; Mind expander; Golden dragon

↳ Pt. hear the colors? - Synesthesia

↳ Mixing of sensation

- taking a trip

- Flashback phenomenon

↳ also in cannabis.

2. Angel-dust  $\Rightarrow$  PCP / Phencyclidine

3. Rave drugs  $\Rightarrow$  M|c  $\Rightarrow$  Ecstasy (MDMA)

GHB

LSD

Amphetamine

Methcathinone  $\Rightarrow$  cheaper & alternative to Ecstasy

↳ (Meow - Meow)

Ketamine

4. Predator drugs / Date Rape drugs  $\Rightarrow$  M|c  $\Rightarrow$  Alcohol

↙

Barbiturates

↙

Rohypnol (Flunitrazepam)

Chloral hydrate (Knockout dots)

Mickey Finn

↓

Combination of Alcohol & chloral hydrate

~~xx~~ Japanese detergent Suicide  $\Rightarrow$

HgS gas

~~JIPMER~~

Hair dye Poisoning  $\Rightarrow$

di +  $\beta$ -phenylenediamine

Causes

Allergic rxn; Renal failure

Sequel gas

$H_2S + CO_2 + CH_4$

## Cardiac Poison

- In all cardiac Manifestation Rate/Rhythm



$\text{Rx} \Rightarrow$  Atropine | symptomatic

- but in Amblyopia



Tobacco  $\Rightarrow$  Smoker's heart

- Respiratory Symb  $\Rightarrow$  Cyanide  $\xrightarrow[\text{2 enzymes}]{\text{Inhibits}}$   $\text{Cy} + \text{O}_2$   
 $\downarrow$  Histotoxic Anoxia

Achlorhydric individuals - Immune

Double salts are Non-toxic

KCN - PD - 0.2-0.3 g.

FP - 2-10 min

"Lee Jones Test"



Used for cyanide Poisoning;  
to differentiate from  
Salicylate Poisoning.

$\text{Rx} \Rightarrow$  Inhalational Amyl Nitrite,  $\downarrow$   
Sodium thiosulfate,  $\downarrow$  ELI LILY KIT  
Hydroxocobalamin;  
(Di cobalt EDTA)

- $\rightarrow$  Gynaecomastia; Trigeminal Neuralgia  $\Rightarrow$  Digoxin Poisoning

Hippus  $\Rightarrow$  Aconite Poisoning

tingling sensation

Chest pain

Hyper salivation

Hypotension

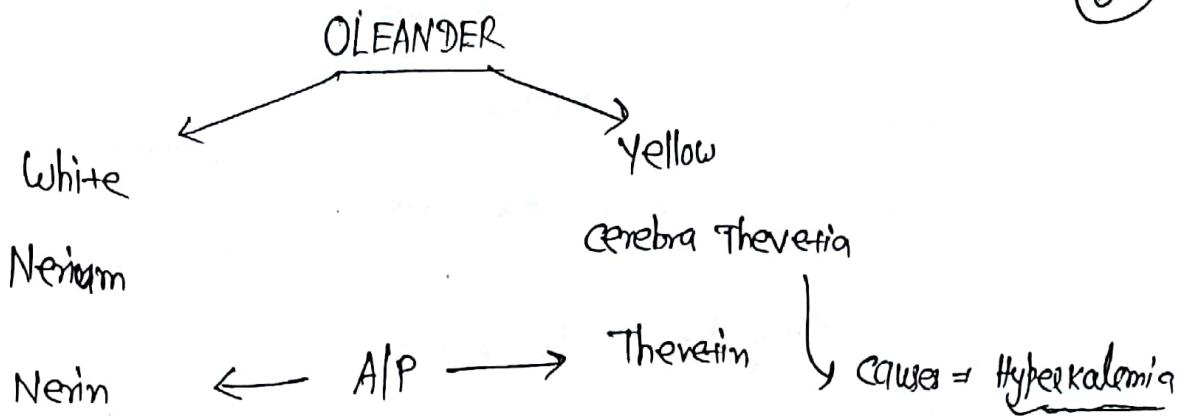
Kas "Monk's Hood/ Mitha bish (MH12)/ Blue Rocket"

Roots is most potent b/lb seed.

FP  $\Rightarrow$  2-6 hr  $\text{QH}$

death due to paralysis of Respiratory center

Around Periorbital region



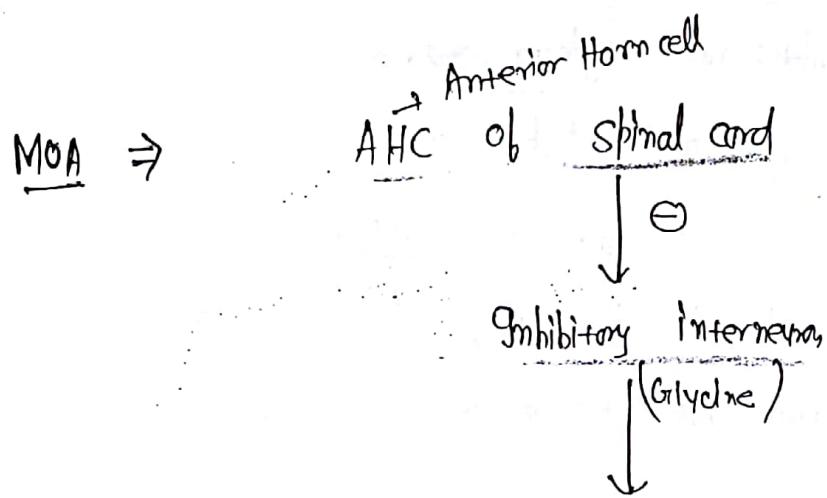
Q. Asphyxial death  $\in$  black colour Mucosa  $\Rightarrow$  Cyanide Poisoning

### SPINAL POISONS

Strychnine Nux vomica | KUCHILA

A/P  $\Rightarrow$  Strychnine ; Brucine

Fatal dose  $\Rightarrow$  1 crushed seed (Unmashed seed is Not digested)



C/F  $\Rightarrow$  All muscles are affected at same time  
consciousness - clear b/w convulsions (GMC)

Spinal postures  $\Rightarrow$  A. Opisthotonus (≡)  $\hookrightarrow$  Backward Arching of spine  
 B. Flexorpostonus  $\hookrightarrow$  Forward Bending  
 C. Pleyropostonus  $\hookrightarrow$  sideways Bending

Rx  $\Rightarrow$  Diazepam; closed dark Room

Antidote for strichnine Poisoning  $\Rightarrow$  Short Acting Barbiturates  
 $\downarrow$   
 Phenobarbital.

Aluminium Phosphide (Alphos / celphos)

Each tab - wt  $\Rightarrow$  3 gm (3 gm of Aluminium phosphide liberates 1 gm of phosphine).

$\downarrow$   
 Aluminium phosphide = 56%.

Phosphine gas  $\Rightarrow$  1 gm FD

- MoA  $\Rightarrow$  Inhibits cyto-c oxidase
- CF  $\Rightarrow$  esophageal stricture; Myocardial Necrosis
- Rx  $\Rightarrow$  Symptomatic hypomagnesemia
- Rx  $\Rightarrow$  Silver Nitrate Paper test  
 $\hookrightarrow$  give black colour
- PM  $\Rightarrow$  Subendocardial hemorrhage  
 Flame shake hemorrhages
- Mc cause of death  $\Rightarrow$  Cardiogenic shock
- \* Aluminium phosphide & hypophosphite are Non-toxic salts

CORROSIVEAcidAlkali? More dangerous↙

coagulative

Liquefactive Necrosis

Necrosis

Stomach

M/c damage organ

Oesophagus

doesn't cause

by "HF"

↑ damage by "Liquefactive Necrosis"

## Vitriolage (Acid Attack)

326(A) IPC

326(B) IPC

↓

↓

Acid attack

Attempt to acid attack

10 yrs to Life imprisonment

5yr to 7yr punishment.

SULPHURIC ACID (oil of vitriol)

Everything black except → teeth → chalky white

FD ⇒ 5-10m

FP ⇒ 12-24 hr

↙ Gastric Perforation - Common wet blotting paper like consistency

Rx ↳

weak alkali;  $MgO$ steroids ↳ b/c we can't neutralize strong acid & strong alkali  
(as it is exothermic).  
↑ Prevents long term complication like Oesophageal stricture

COD in Adults  $\Rightarrow$  ~~Gas~~ Gastric Perforation

COD esp. children  $\Rightarrow$  Reflex vocal spasm

### Nitric Acid

- Stains all the GIT & tissue  $\equiv$  yellow colour

$\downarrow$   
"Xanthoproteic Reactions"

- Brown discolouration of Urine

- Inhalation of Fumes  $\Rightarrow$  Lacrimation  
Photophobia

### Boric Acid

- Alw "Boiled Lobster syndrome"

### Oxalic Acid (salt of Somel)

- Used to Remove Ink for largely.

C/F  $\Rightarrow$  GIT damage;

Hypocalcemia;

Oxaluria  $\Rightarrow$  Enveloped shape crystals

Rx  $\Rightarrow$  10% Ca gluconate 10 ml i.v

C/I  $\Rightarrow$  Large Amount of water

## CARBOLIC ACID / PHENOL

(65)

- Miosis
- Lock jaw
- Delayed Putrefactions
  - ↳ Also by Antimony; Zinc
- Carbolic
  - ↳ Colourless  $\xrightarrow[\text{standing}]{\text{air}}$  Green
  - dt + hydroquinone; Pyrocatechol  $\xrightarrow[\text{in Air}]{\text{oxidized}}$

- OO chronosis (Blackish pigmentation of cartilage)

### Chronic - Phenol Marasmus

Rx  $\Rightarrow$  Hemodialysis  $\xrightarrow{\text{also indicated in}}$  Cl in

B Barbiturate  
L Lithium  
A Alcohol  
S Strychnine  
T Theophylline

K Kerosene  
B Benzodiazepene  
C Copper sulphate

### Colour of Stomach Mucosa in different Acid poisoning :

Black	$\rightarrow$	$\text{H}_2\text{SO}_4$	All these damage caused by coagulative Necrosis
Yellow	$\rightarrow$	$\text{HNO}_3$	
White	$\rightarrow$	$\text{HCl}$	
Brown / Leathery	$\rightarrow$	Phenol	

## Methyl Alcohol

- Wood Alcohol
- Formic Acid
- ClF -
  - Abd. cramps
  - optic Neuropathy (irreversible)
- ED -
  - 60-200 ml
  - Hooch tragedy

Accumulation of Formic Acid

↓  
Lactic Acidosis / High Anion gap Metabolic Acidosis

Rx ⇒ Formic Acid  $\Rightarrow$  4-Methyl Pyrazole

↓

Inhibits alcohol dehydrogenase

if doesn't work

Ethanol  $\Rightarrow$  given both as i.v. / oral

Hemodialysis B/c it competitively inhibits the conversion of Methanol  $\rightarrow$  Formic Acid.

Folic Acid or Folinic acid enhances the metabolism of Formic Acid to  $\text{CO}_2$ .

\* Methanol concn is high in "Illicit Alcohol". Illicit  $\Rightarrow$  Forbidden by Law; Rules or custom.

ALCOHOL  $\Rightarrow$  Rectified alcohol  $\Rightarrow$  90% Alcohol

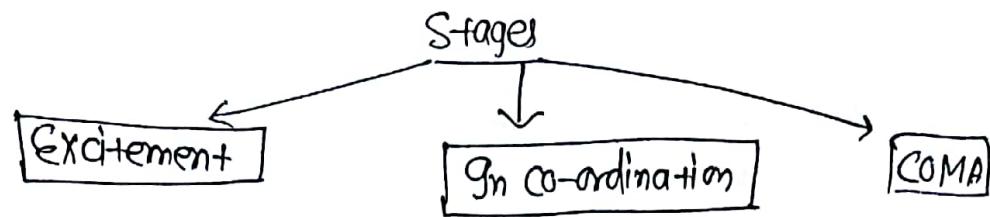
Absolute alcohol  $\Rightarrow$  99.5% alcohol

Maxm alcohol content is brt. In which hard drink  $\Rightarrow$  vodka (60-70%)

Absorption  $\Rightarrow$  Stomach  $\rightarrow$  20%

Intestine  $\rightarrow$  80%

Metabolisation  $\Rightarrow$  Liver  $\rightarrow$  90%



- **Excitement**  $\downarrow$  Blood Alcohol content
  - $BAC < 150 \text{ mg/l.}$
  - $150 - 400 \text{ mg/l.}$
  - $> 400 \text{ mg/l.}$
- **In co-ordination**
  - $BAC < 150 \text{ mg/l.}$
  - $150 - 400 \text{ mg/l.}$
  - $> 400 \text{ mg/l.}$
- **Coma**

\* 510 I.P.C

↳ Creating Public Nuisance under  
Intoxication is Punishable

↳ 24 hr. drif + 10/- fine

Windmark's Formula

$$\{ a = brc \}$$

$a$  = Amount of alcohol in drink

$b$  = body weight

$r$  = constant

$c$  = concn of alcohol in blood

\* In Stage ① & ② : Pupil is dilated

Stage ③ : Pupil is constricted

↳ There is  $\uparrow$  MacEwans

Stimulation of person causes  
pupil to dilate & Return to  
constricted pupil.

Q. Where do you expect higher Amount / concn of Alcohol?

~~Blood / Urine (3:4) OR (1:1.33)~~

• FD + 150 ml of absolute alcohol.

Alcoholic Backout =  $80 - 100 \text{ mg/l}$  of BAC

Kozelka & Hine

Test  
Cavett's

Breath  $\xrightarrow{\text{Drunkometer}}$  Analysers

- Henry's Law (Based on)
- Potassium dichromate

Gas chromatography  
 $\downarrow$   
Best.

## Legal

Limit while driving  $\Rightarrow$   $< 30 \text{ mg/dL}$

Legal age of drinking  $\xrightarrow{45-60 \text{ mL}}$   $\Rightarrow 25 \text{ yrs.}$

- Alcohol tends to follow zero order kinetics
- Rate of Metabolism:  $15 \text{ mg/100mL/hr}$

6 PM  $\longrightarrow$  9 PM  
?  
 $\downarrow$   
 $145 \text{ mg/dL}$

## ORGANOPHOSPHORUS COMPOUNDS

### Alkyl phosphatase

- Malathione
- HETP (Hexa ethyl tetra phosphate)
- TEPP (Tetra ethyl pyro phosphate)

### Aryl phosphatase

- Parathion (Folliol/Nitroso mine)
- Paraoxon
- Diazinon (PIK 20)

Irreversible inhibitors of enzyme Cholinesterase by phosphorylating the catalytic site of enzyme. it hydrolyze "Ach".

ClF  $\Rightarrow$  Chromolacryomia  $\Leftrightarrow$  Shedding of Red colour tear & + Abnormal porphyrin Metabolism.

Lacrimation; Miosis (pinpoint pupil); Pulmonary edema  
Salivation; Muscular fasciculation;  
Sweating; Tremor;

\* chronic exposure to OP eg (Pristothenoyl phosphate)

(67)

↓  
Additive in Lubricating oil

Delayed Neuropathy  
(1-2 weeks after exposure)  
↓

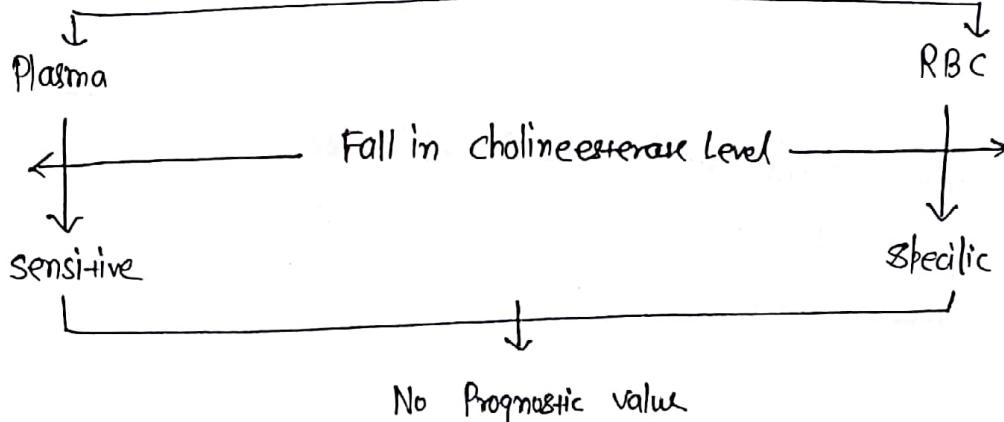
- ↓ w Demyelination of Axons
- Not caused by cholinesterase inhibition but Rather by Neuropathy Target esterase (NTE) inhibition

Intermediate syndrome  
(after 1-4 days),

- Muscle weakness
- Caused by cholinesterase inhibition
- doesn't Respond to oximes or Atropine.

Δx ⇒

Choline esterase Level



Rx ⇒

① Activated charcoal;

② ↑↑ of choice ⇒

Atropine Sulfate

↳ causes resp. depression.

③ Oximes (Pralidoxime)

## CARBAMATES

- Reversible inhibitor of cholinesterase
- e.g. Physostigmine; Neostigmine; Edrophonium; Carbamyl; Propantheline.

⇒ Rx ⇒ Atropine; Oxime  
↳ Not useful.

## ORGANOCHLORINES (Chlorinated hydrocarbons)

DDT

Benzene Hexachloride  
(Lindane)

Toxaphenes

Cyclodienes  
↓

e.g. Aldrin;  
Dieldrin;

endrin (Plant Penicillin);

Mirex;  
Heptachlor;  
endosulfan;  
chlordane.

endrin is also "Plant Penicillin" b/c  
of its broad spectrum activity against  
insect pests

### NDPS ACT, 1985

- Narcotic Drugs Psycho-trophic Substance Act, 1985.
- It covers only Narcotic & Psycho-tic drugs.
- Nicotine is Not Cover under NDPS Act.

NDPS ACT :- ① Embezzlement of opium is an offence.

↓  
(जाकर)

Embezzlement of Any other is Not offence (only opium is an offence).

② This act ~~prohibits~~ Rehabilitation of Drug Abusers  
(Not only Punishment; but also)

### DRUG TRAFFICKING

Body Packer @ Body Bag : Person who transport the drug;

Pusher : Person who distributes the drug (distributes to clients)

Stuffer : consume the drug for the fear of being caught.

client/ Abuser : consume the drug for satisfaction.

### COMA COCKTAIL

- Given to pt. who comes  $\in$  coma  $\in$  Unknown history.

- Consist of - Dextrose - Hypoglycaemia

Naloxone - Oploid induced coma

Vit. B<sub>1</sub> / Thiamine - Alcohol induced coma

### DRUGS & COSMETIC ACT, 1940

- Amended by Drugs Act 1964 to "include Ayurvedic & Unani drugs". (AI+U).
- AI+U The Label or container of Medicine should display the formula or a list of ingredients contained in the drug.

## SMELL OF POISONS

$\text{CN}$ (cyanide)	$\Rightarrow$	Bitter Almonds
Arsenic	$\Rightarrow$	Garlic Like
OPC (organophosphates)	$\Rightarrow$	Kerosene Like
$\text{H}_2\text{S}$	$\Rightarrow$	Rotten egg
$\text{ZnP}$ (Zinc Phosphide)	$\Rightarrow$	Fishy
Cannabis	$\Rightarrow$	Burnt Rope
Nitrobenzene	$\Rightarrow$	Shoe Polish
Paraldehyde / chloral hydrate	$\Rightarrow$	Acrid / Peas
	$\Downarrow$	
		Klar "DRY WINE"